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VETERINARY REVIEW

EDITOR

O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.
PRINCIPAL OF THE ROYAL (DICK) VETERINARY COLLEGE, EDINBURGH

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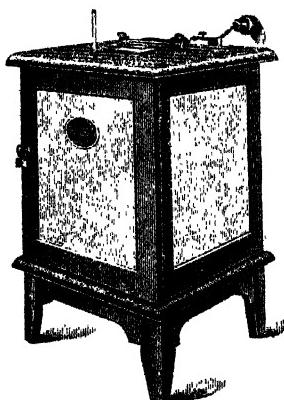
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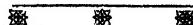
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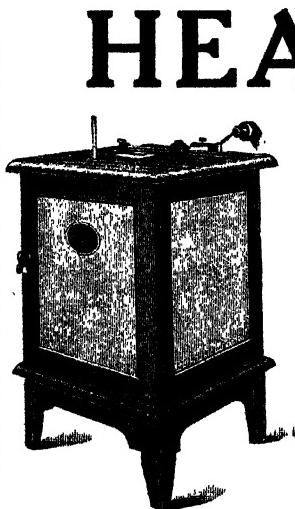
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VETERINARY REVIEW.

EXAMINATIONS.¹

"This is no flattery: these are counsellors that feelingly persuade me what I am."

A TEACHER whose name, it is safe to say, is known all over the scientific world recently said, in the hearing of the present writer, that the primary purpose of a school is to get students through examinations. Putting the best possible construction upon the remark, and refraining from a fairly obvious retort, it shows what a profound influence examinations have upon the teacher, even upon one of liberal outlook and wide teaching experience. It indicates that the teacher may readily be induced to pay more attention to the instillation of *matter*—because this pays from an examination point of view—than to the inculcation of sound, and ultimately much more useful, *method*. Unfortunately the filling of the student with matter is an easier business than the slower process of training in method; and, equally unfortunately, the examination of a student in memory work is easier than the discovery whether he has or has not acquired sound methods. Again, the teacher whose students have to pass an examination in the subject taught has an easier task than he whose pupils have no examination looming in the distance, inasmuch as the teacher preparing for an examination is ensured a careful, if not always an interested and intelligent, hearing; while he whose students are not looking forward to an examinational test is compelled

¹ *Examinations and their Relation to Culture and Efficiency*, by P. J. Hartog, C.I.E., M.A., B.Sc. With a speech by the late Earl of Cromer, O.M., G.C.B. London: Constable & Co., 1918, pp. xviii.+145. 3s. 6d. nett.

to so labour as to fix the attention of his hearers, or, failing this, suffer the purgatory of lecturing to an apathetic audience. It is for this reason that some teachers are loth to conduct a course at the end of which there will be no examination. Which teacher produces the better educational result is hardly in doubt; nor is there much question which teacher suffers the more intellectually.

That to test the candidate's memory is easier than to determine his ability to do and to reason, will probably be admitted without proof. All examiners certainly will confess that there are limitations to the information ascertainable by examinations. Once the examiner attempts to step beyond a test of technical efficiency, he finds his difficulties increase, and the further he goes the more obvious becomes the impossible.

Probably not a single reader would have difficulty in recalling to mind examples of fellow-students who were held in high esteem for brilliancy; were able, with little effort, to master and remember anything they were told or had read; passed examinations with ease and distinction; were, in short, endowed with a good memory; and yet, as their subsequent careers clearly demonstrated, had all too little of ability as applied to daily professional work. Their five senses were not trained, or, being able to see, hear, and feel, they were not able to arrive at a sound and reasoned conclusion. Doubtless their weakness was most noticeable in the presence of the unusual, and the unusual is the most important—without wishing to pen a cheap epigram, we had almost said the most common—test of ability. ". . . The ability to cope with the unusual, and the faculty of foreseeing. . . . *Savoir pour prévoir, afin de pouvoir.* . . ." In short, and without wishing to labour what has been said more than once, brilliant failures are the fruit of a quasi-educational scheme, whereby the student is left replete with information but starved of method—using the word in the broadest sense. Perhaps it is as Gréard has expressed it:

“Toute leur énergie cérébrale a été usée pendant la préparation à l'examen, et quand ils arrivent plus tard à la vie, il ne leur reste de force que pour de modestes labeurs en vues de rôles secondaires.”

There are critics of present educational methods who hold that the student is taught too much ; that a great deal he is expected to know will be useless to him in his professional work ; that the old-time student, who had to learn much less, proved to be an infinitely better professional man. As usual, there is much that can be said on both sides, but, however much truth there may be in the criticism, there is no one with a modicum of understanding who will support the contention that the student can *do* too much. After all, it is not what he is expected to know that matters so much ; it is what mental cultivation and training he has received that is all-important. Vocational training is obviously held in high esteem, and mental training is considered of little count by him who is constantly asking, What use will this be to the student when he becomes a member of his profession ? Vocational training, naturally, is not to be belittled, but it must be clearly recognised that it is easier to make it too narrow than too broad.

In real education appetite grows on what it feeds—at least this is the case with those who are best worth pains in educating. Experience shows that if the purely utilitarian is cultivated, the desire to acquire knowledge is gradually atrophied. And the professional man who does not desire eagerly to add to his stock of knowledge to the last day of his professional life is not likely to do overmuch credit either to himself or to the profession to which he belongs. “Man wants to know : when he ceases to want to know, he ceases to be a man.”

The nice adjustment of the utilitarian and the academic (hateful adjective) in the training of the professional man has exercised some of the best thinkers of our age ; and the more deeply the matter has been pondered the less dogmatic

has been the pronouncement. It is only the very young teacher or the non-teacher who is cocksure. But, however cautious the expressed opinion may be, it is generally agreed that changes in teaching are controlled and conditioned by examinations. Many and bitter have been the criticisms of our present system (some say lack of system) of examinations, and some have even gone so far as to say that we should be none the worse if these tests, as at present conducted, were abolished. Where the tests are not framed for the protection of the public this may be true, but, unhappily, no adequate substitute has, as yet, been formulated in the case of candidates for the professions. We are therefore compelled to suffer the affliction of professional examinations, but there is no reason why we should not have them brought as near as possible to that condition in which they would effect a maximum of good with a minimum of ill. Change there must be. Opinion will scarcely permit stagnation of examinational methods ; but change must be effected with caution, and the reasons for change must be clearly defined and solidly substantiated. Obviously, then, the first step to reformation implies an adequate analysis and thorough understanding of examinations and their functions. For this reason the essay by Mr. P. J. Hartog on *Examinations* is to be welcomed. He pleads for a comprehensive scientific investigation of our examination system, and lays down certain lines along which the investigation might run. Not the least valuable feature of his book is the lucidity and temperateness with which the case for and against modern examinations is stated. He does not desire to appear "as counsel either for the plaintiff or for the defendant in the great controversy on examinations which has raged intermittently for more than half a century in this country, as in other countries, but rather as one of the public deeply interested in the issues, and trying to see clearly through the heat and dust of the conflict."

In any inquiry directed towards an assessment of the value of modern examinations it must be kept in mind that they

have grown gradually out of the non-professional tests of the mediæval universities, and still largely retain many of the features which were probably satisfactory in the early days of the institution of such tests. This, of course, is an explanation and not a justification. In assessing their value we may well apply to them the questions suggested by our author : Are they wisely designed ? Do they work with certainty and accuracy ? Do they tend, on the whole, to improve the boys and girls, the men and the women, whose education, whose lives and careers they so largely control ? Are they really serving in the best possible way the national and imperial purposes they are supposed to serve ? "The main question is, surely, not which candidates can do the most difficult things, solve the most Chinese of puzzles, remember the most unrememberable of formulæ, but whether the examination is helping to turn out the best teachers, doctors, engineers, industrial botanists, industrial chemists."

In the ultimate analysis, examinations are either memory-tests (knowledge-tests) or capacity-tests, or both. Memory-tests unquestionably have their value, for who shall say when the faculty of a good memory will not be useful ; but there can be little gainsaying that the memory-test has been unduly exalted in most examinations—including those applied to the prospective member of a profession. Someone has cynically defined education as being what remains after we have forgotten what we have learnt ; and perhaps, in the same cynical spirit, examinations might be defined as tests framed to ascertain what we are about to forget.

From the point of view of the professional examination, it has to be remembered that a knowledge-test does not necessarily imply capacity beyond that of being able to memorise ; while a capacity-test does imply knowledge. In the pure memory-test of the Who-went-how-many-times-round-the-walls-of-where ? pattern, the candidate may be able to offer a perfect answer of the text-book kind without the possession of any real capacity whatever. But if the candidate is able

to diagnose a disease from the clinical examination of an actual patient, or can arrive at the determination of the chemical composition of a solution by practical analysis, he exhibits the possession of knowledge (memory) as well as capacity. Moreover, the knowledge displayed in a memory-test is not certain to remain long after the examination has been passed—in great probability it has been “got up” solely for the purposes of the examination ; but if the candidate has acquitted himself creditably in a practical examination, it is reasonable to assume that his capacity will not disappear shortly after the examination difficulties have been overcome.

One of the most difficult of the many problems associated with examinations in general, and with professional examinations in particular, arises out of the fact that the examiner cannot possibly cover the whole of the subject of examination. That is, he is compelled to examine by “sample.” How, then, can fairness of sample be assured, and how may chance (good or bad luck on the part of the candidate) be reduced to a minimum ? This is not a matter which concerns the examiner and the candidate only—it is a matter on which the public have a right to demand a reasonable measure of assurance. Clearly one way in which chance may be reduced is by increasing the volume of the sample—that is, by lengthening the time during which the candidate is under examination by external examiners. But there are very obvious limits to this form of check. A far better mode appears to be the combination of teacher and external examiner, with power to review and appraise the work done by the candidate during the whole course of instruction.

Another weakness of professional examinations, and one Mr. Hartog seems scarcely to appreciate fully, is the method of examining by “subjects,” each subject being regarded very much as of the nature of a watertight compartment. This, it appears to the present writer, is productive of the most difficult of all the problems of professional examinations. It is human to neglect a subject once it has been “passed,” and

the student is very human ; but it is undesirable, and examinations might be better framed to restrict the function of the human weakness as far as possible. With a complicated test such as a professional examination, it is scarcely possible to go back to the system of "boards"—composed of specialists—before whom, as a body, the candidate must appear. Nor is it possible to elect examiners of such encyclopædic knowledge as would fit them to test the student's acquaintance with all the subjects of the curriculum. But there is a middle way which has its attractions. There is no reason whatever why an examiner in, say, pathology should not be expected to ascertain how much knowledge of normal structure, function, and chemistry remains with the candidate. It is not suggested that the examiner in pathology should be a specialist in histology, physiology, and chemistry, but he might be instructed to demand of the candidate the knowledge of histology, physiology, and chemistry that is necessary for the proper understanding of pathology. It may be answered that this is already in the power of the examiner. That it is in his power is not enough. It should be his duty, and time should be afforded him in which to conduct his examination with thoroughness and *without haste*. The need for leisure in examinations is, generally speaking, clamant.

Another point upon which there is evidently room for differences of opinion is the relative value of the written, oral, and practical forms of examination. According to the regulations of some examining bodies, it is in the option of the examiner to give or withhold an oral examination, as the written paper suggests. If the paper is definitely good or definitely bad, no oral need be given. This is an undesirable regulation or instruction, and particularly so in professional examinations, for it is distinctly opposed to the principle of "fairness of sample." It may be argued that a good paper, by itself, determines nothing more than that the candidate has been asked questions that his memory has enabled him to answer satisfactorily. In many, if not most, cases the

only *abilities* the candidate has displayed are those of being able to write more or less legibly and express himself more or less lucidly. It must be admitted that written questions are sometimes framed to test the reasoning power of the candidate, but the bulk of them are memory-tests pure and simple. An indifferent written paper may be indicative of sheer bad luck on the part of the candidate.

An oral and, wherever possible, also a practical examination, it may be contended, should always be given. And it is hardly necessary to say that the oral examination should be, in the utmost possible degree, an ability-test, and not merely an extension, in another form, of the written examination. The value of a practical examination hardly needs discussion. Some regard it, and with reason, as the most important part of a professional examination, for though the oral examination *may* be a capacity-test, a practical examination *must* be.

A problem of more than passing moment is the effect produced on the candidate by the ordeal of examination; and closely related thereto, the consideration that should be extended to the candidate because of his "nervousness." It is reasonable to assume, though this has not as yet been subjected to scientific investigation, that the mental powers of the candidate suffer from the strain of a prolonged examination, and that the results towards the end are scarcely to be regarded as normal. It is quite conceivable that some examiners will hold that an examination has for one of its objects the test of the "staying power" of the candidate, though possibly most will be sufficiently human and humane to expect something less than the best from the student whose brain has already been on the stretch for some hours or days.

Then, again, what is to be done in a case similar to that mentioned by Mr. Hartog—a case which finds its parallel in many examinations. "A candidate in *Materia Medica* in a northern university, who was unable, owing to examination

fright, to distinguish the taste or the smell of the sample of cod-liver oil that he held in his hand, on being asked, ‘Where does cod-liver oil come from?’ replied, ‘The whale.’” Here the answer was manifestly too absurd to be taken seriously; but the question arises: Is a candidate, who can so thoroughly lose his head through nervousness, to be judged fit to enter a profession in which losing one’s head is detrimental to professional efficiency, and a danger to the public?

These are only some of the problems that confront the conscientious examiner, but they will perhaps suffice to show that examinations are not merely a matter of question and answer. The subject is decidedly complex, and cannot be too carefully and thoroughly investigated. Decidedly, education and examinations are not susceptible of those off-hand conclusions at which some writers arrive without the least apparent difficulty.

DAVUS SUM, NON OEDIPUS.

STEPHEN HALES, D.D., F.R.S.

THE first British School of Science established in this country was under the patronage and active interest of Charles II. Experimental physiology was not entirely overlooked, as is evidenced by the work of Lower and Hooke in 1667 and of Lyster in 1684, but it was not for many years after the founding of the Royal Society that any great forward movement in this branch of science was made, and then, curiously enough, not by a physiologist but by a divine.

Stephen Hales, a man of good family, was born in Kent in 1677, twenty years after the death of Harvey. In due course he proceeded to Cambridge and was educated at Corpus Christi, taking his M.A. in 1703. During his stay in Cambridge it is evident he evinced a taste for science, for it is stated that he worked in the laboratory of Trinity College, which had been established by the great scholar Dr. Bentley, Master of Trinity, who was ever anxious that his college should be foremost in every branch of learning. It was doubtless in this laboratory that Hales obtained his insight into chemistry. Assuming that he left Cambridge in 1703, we know nothing further of his movements until 1708, when he was appointed perpetual curate of Teddington, an appointment which he held till the day of his death.

At Teddington Hales established a laboratory, and it is easy to imagine that he spent more time there than in parish duties, though these were by no means neglected. It was in his laboratory at Teddington that the Prince of Wales, afterwards father of George III., was fond of surprising him at work. How he came to know Hales we are not informed, but as the latter received plants from the King's garden at

Hampton Court, it is possible that his botanical work brought him into contact with the Court. Nor was the Prince of Wales the only member of the Royal family interested. Years later Hales was Clerk of the Closet to the Princess-Dowager, who was anxious that he should accept a canonship at Windsor. This honour he declined, preferring retirement at Teddington, lest it should interfere with his scientific investigations.

Hales held another living at Faringdon, in Berks, and occasionally resided there, but his life's work was carried out at Teddington.

It was either just before or shortly after his appointment to Teddington that Hales made his first experiments on blood-pressure. The precise date is uncertain, for it was not until 1727 that any reference was made to them in print, and they were not published in full until 1733. It is rather remarkable that he allowed so long a time to elapse in recording such epoch-making experiments, and in the account of his work there is nothing to explain the delay. That he communicated the facts to the Royal Society there is no doubt, but no paper on the subject was published in their *Transactions*. It is probable that he wished first to examine the pressure in all animals; dogs were employed in 1707—the year I have assumed from internal evidence that he first began the work; horses were not examined until six years later.

The fact that a parson took up vivisection will at once strike the ordinary observer. Hales tells us that this part of the work was very repugnant to him, and that people may wonder why a man neither by profession nor inclination "prompted to deal with anatomical operations" should engage in such an inquiry, "especially in an age that abounds with skilled anatomists." He adds that the disagreeableness of the work prevented him from pressing the matter further. It would certainly seem that the interest of Hales in the question of blood-pressure was quite secondary to that of his interest in vegetable physiology. He knew that the sap

circulated in plants, and says that in consequence of the information he gained by the statical investigation of "vegetables" and chemical analysis of the air he was induced to apply the same methods of inquiry to animals. This statement is really the key to his investigations into animal physiology; the circulation of the blood and the circulation of sap were phenomena so closely allied that he doubtless felt that their investigation would be mutually helpful to a clear understanding of the process.

Hales succeeded in obtaining definite information of "the real force of the blood" in the vessels long before he was able to determine the force which the sap of plants exerted—in fact, by a mere accident, he was subsequently enabled to devise a physiological process for its determination in the vine.

His attempts to analyse the air would appear to have been the starting-point in his experiments on respiration. He showed that air was "plentifully inspired" by plants not only at their roots but at several parts of their trunk and branches; hence he turned his attention to an analysis of air, hoping to discover wherein its great importance to life might consist. He spent two years over this work and failed, for, as F. Darwin points out, he had no means of distinguishing one gas from another, but the work led him to examine the respiratory processes in man and animals, and he experimented upon himself and dogs. Just as his work on blood-pressure led him to determine the capacity of the heart, the velocity of the blood, and the strength of arteries and veins, so his work on respiration led him to ascertain the intra-thoracic pressure and the effect of positive pressure, the influence of artificial respiration, and the size of the respiratory area. He demonstrated the effect on respiration of opening the cavity of the chest, and the removal of the distress by closing the wound—a fact turned to excellent account in the present war, in extensive operations on the cavity of the chest in man.

Hales disclaimed all medical knowledge, yet he was

greatly interested in the treatment, both medical and surgical, of stone in the bladder. He attempted to determine the best solvents for stone, and was one of the supporters of the notorious Mrs. Steevens, who obtained a grant of £5000 from Parliament for her discovery of the calcined eggshell and snail treatment! He also devised an ingenious pair of forceps for removing calculi from the urethra, subsequently adopted in veterinary surgery on a magnified scale for removing "roots" from the oesophagus of cattle. He was an advocate of the medicinal virtues of tar water, and in spite of his disclaimer that treatment is "the province of the physician, with which he is not qualified to meddle," he recommends this agent to the notice of Bishop Hildesley in the treatment of what is now known as clergyman's sore throat.

Hales was also a hygienist of the first order. He devoted years of his life to the study of ventilation, and introduced, though not without considerable opposition, mechanical ventilation into prisons and ships. The wonderful results thereby obtained in reducing the number of cases of gaol fever—typhus—are attested by his correspondents. In slave ships and men-of-war, both notoriously overcrowded, his system of bellows worked wonders, and he also remarks on the effect of his method of ship ventilation on the transport of animals. The ventilation of mines and hospitals was also dealt with. He noted that wounds healed better in tents with good ventilation than in foul air. He succeeded in getting the Government to adopt his system of ventilation for those prisons containing French prisoners of war, and, by corresponding with the enemy (Du Hamel, the naturalist), for which he hoped no one "would inform against him," he succeeded in getting the French Government to adopt his system in the ventilation of French prisons containing English prisoners of war. He had, however, been anticipated in the matter of mechanical ventilation; unknown to him it had been employed on ships by a Swedish captain of

Engineers, and by Henshaw in this country in the ventilation of rooms.

Another interest of Hales' life was his campaign against intemperance. Doubtless he placed this in the foreground of his life's work, for he describes drink as the devil's masterpiece. No matter what subject he is handling, the "drink" question creeps in. He estimated the annual loss of life throughout the world from drink alone to be over 1,000,000, and remarked upon the "surprising advance" in his time in the drinking of brandy. Not long before his death, in a letter to Henry, Dean of Killaloe, he stated that his life's work had been blessed with success, yet nothing he had done had given him greater satisfaction than his twenty-six years' campaign against drink. In a paper on the "Cause of Earthquakes" he says that if as many people were destroyed by earthquakes as are destroyed yearly by drink "how great a terror and consternation would it cause!"

This many-sided man had other interests in life. He wrote on "Methods of Distillation," "Checking the Progress of Fires," "Abating the Force of Hurricanes," "The Strength of the Principal 'Purging Waters,'" "The Removal of Taste from Milk Imparted by Certain Articles of Food," "Ice-Houses and Ice-Cream," "The Drinking of Tea and Other Liquors Very Hot," "The Distillation of Sea Water," "Experiments on Steel Waters," "Proposals for Cleansing away Mud from Rivers and Harbours," "The Preservation of Animals Whole by the Injection of Brine into the Blood-Vessels," "To Sweeten Stinking Water," "On the Strength of Ligaments and Periosteum," "Hydraulic and Hydrostatic Experiments on the Intestinal Tube of Dogs," "Description of a Gauge for Taking Deep-Sea Soundings," "The Nature of Urinary Calculi." These, and other subjects, show how manifold were his activities.

No detailed examination of his life's work is here permissible. His two outstanding works in the realm of

physiology are *Vegetable Staticks*, with which was included his experiments on respiration, published in 1727, and *Statistical Essays* in 1733. The latter work contained as a first volume his *Vegetable Staticks* of 1727, with some slight amendments; the second volume is almost wholly devoted to his experiments on blood-pressure. The guiding principle in all his work was quantitative measurements; he tells us that as the most exact proportions of number, weight, and measure have been shown in the creation of living bodies, so "the most likely way to get any insight into the nature of those parts of the creation which come within our observation must, in all reason, be to number, weigh, and measure" them. When he furnished Teddington with a pure water supply he precisely calculated the delivery per second of time. He measured the area of blood-vessels, and by means of wax casts calculated the area of the ventricles of the heart. Similarly, by means of ruled squares he calculated the area of leaves. The utmost exactitude and precision is to be found everywhere throughout his work, and the accuracy of his blood-pressure experiments has never been challenged though they are 200 years old.

In plant physiology Sachs, who is quoted by F. Darwin, tells us that Hales' treatise was the first comprehensive work the world had seen which was devoted to the nutrition of plants and the movement of their sap. Hales had the art of making plants reveal themselves, and by his ingenious experiments forced them to betray the energies hidden in their apparently inactive bodies. Hales recognised that the air might be a source of food for plants, and connected the assimilative function of the leaves with the action of light, though he failed to find the mode of interaction (F. Darwin). The same writer informs us that before Malpighi (1671) vegetable physiology was still where Aristotle had left it, whereas, fifty-six years later—1727—the work of Hales had made it an experimental science in the modern sense.

Hales' chief work on hygiene was undoubtedly that deal-

ing with mechanical ventilation. In his day the death-rate from overcrowding in prisons was appallingly high. It dropped to an almost insignificant figure under the influence of ventilation, and he gladly publishes the results obtained by correspondents who were in a position to know. In the Savoy Prison the annual deaths from typhus before the place was ventilated by Hales were from fifty to one hundred a year; after the building was ventilated the deaths fell to two per annum. In Newgate eight persons died every fortnight from typhus; after ventilation the deaths fell to one every two weeks.¹ Similarly in slave ships ventilated by his method the mortality fell to an insignificant figure. It is clear that he did not regard this merely as a commercial advantage, for in a sermon preached at St. Bride's before the Trustees of the Colony of Georgia in 1734 he advocated the extension of Christianity to slaves, on the principle that they had souls to be saved.

His chemical work was suggestive rather than creative; he showed how gases could be collected over water, and paved the way for future discoveries by announcing the existence of gases in a free and in a combined condition. He was also led to speculate on combustion. His analysis of urinary calculi and experiments to determine solvents for "stone" were carried out not only for their chemical but also their philanthropic interest. His two years' attempt to analyse the air must, however, have caused him some disappointment. F. Darwin says that Hales must be regarded as a chemist and physicist who turned his knowledge to the study of life, rather than a physiologist who had some chemical knowledge. He nevertheless admits that Hales was essentially a physiologist.

Stephen Hales is described by all who knew him as a man of singular sweetness of character; his "native innocence and simplicity of manner" were marked characteristics. Horace Walpole described him as "a poor, good, primitive

¹ Stukeley tells us that nine of the carpenters engaged in ventilating Newgate Prison by Hales' method were "seized with fever."

creature," but those who knew him best were able accurately to place this "Christian philosopher" in his true setting. Pope, who was a neighbour, always loved to see "so worthy and good a man," and his "constant serenity and cheerfulness of mind," described by another, is what might be expected from a philosopher and divine endowed with a "serene temper and excellent constitution." He led a long and useful life of incessant work and "patient thinking," in order to "promote the best welfare of mankind." As F. Darwin expresses it, he "cared passionately for bettering the health and comfort of his fellow-creatures and improving their conditions of life."

Hales was engaged in work up to shortly before his death; a fortnight prior to that event he wrote of his intention to publish a new edition of his book on *Ventilation*, and referred to a paper communicated to the Royal Society "On the Benefits to be Derived from Wetting the Body with Salt Water." Up to the last we are told he retained a "vigour and serenity of understanding and clearness of ideas which he himself valued as the most perfect of human pleasures."

In a biographical notice written a month after the death of Hales it is stated that there were two things in his character which particularly distinguished him—one was his desire not to add to his wealth in case it left him less time for research; the other was his indifference to ingratitude from those he had striven to help. It is said that he regarded the latter circumstance in the light of an experiment which could not be applied to useful purpose and should therefore be laid aside.

His scientific work was recognised by election to the Royal Society in 1718; he received the Copley Medal in 1739, and was one of the eight foreign members of the French Academy of Sciences, being elected in 1753 on the death of Sir Hans Sloane.

Hales died on 4th January 1761 at the age of eighty-four,¹

¹ Curiously enough, in a letter to Dr. Henry, Bishop of Killaloe, written in 1757, he concludes by saying he is eighty-eight years old!

having served the parish for fifty-one years. He is buried in Teddington Church under the tower which he erected at his own expense. There is a monument to his memory in Westminster Abbey, placed there by the Princess-Dowager. He was married but had no children.

F. SMITH.

LONDON.

Note.—In the preparation of the above account Hales' work has been extracted from his published books and papers, his life from the *Gentleman's Magazine*, January 1761 ; the *Annual Register* for the same year ; the *Family Memoirs of the Rev. W. Stukeley*, 1753 ; Dr. Henry's edition of Hales' *New Year's Gift to Dram Drinkers*, 1762 ; *Peter Collinson (Naturalist)*, 1770 ; *Memoirs of Bishop Hillesley*, by the Rev. Weeden Buller, 1799 ; R. J. Thornton's *Elementary Botanical Plates*, 1810 ; *Cambridge Natural Science Manuals, Biological Series, Lectures on the History of Physiology*, by Sir M. Foster, 1901 ; *Cambridge History of English Literature*, 1916 ; *Encyclopaedia Britannica* ; *The Dictionary of National Biography*, and especially *Rustic Sounds and Other Studies in Literature and Natural History*, by Sir Francis Darwin, 1917.

ABSTRACTS.

CLINICAL.

THROMBOSIS OF THE AORTA IN A MARE (Note sur un cas de thrombose de l'aorte postérieure chez une jument). QUENTIN. *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 414-415.

A thirteen-year-old mare, on returning to the stable after being shod, suddenly became lame with extension and rigidity of the hind limb. A few yards farther on the animal fell suddenly. The expression was anxious, the eyes staring, the nostrils contracted, the respiration accelerated, the conjunctiva a dark red, and the facial artery obviously distended. The trunk, shoulders, neck, and face were hot and burning, and covered with an abundant hot sweat. The hind limbs and the croup, on the contrary, were cold and dry. There were violent expulsive efforts, with protrusion of the clitoris and vaginal retropulsion. The animal groaned, and even cried out.

The most important post-mortem discovery, explanatory of the symptoms, was a dilatation of the terminal part of the aorta, containing a thrombus which weighed 250 grammes. This was yellowish, composed of concentric layers, with a rounded anterior end, and prolongations from its posterior extremity into the external iliac and hypogastric arteries. In addition, the following lesions were found:—A cyst of the right ovary as large as a turkey's egg; diffuse subacute nephritis (the right kidney weighed 830 grammes, and the left 1200 grammes); and a certain degree of cardiac hypertrophy, more particularly of the left ventricle.

*ESOPHAGEAL DILATATION IN A COW (Schlunddivertikel bei unsfern Haustieren). W. FEY. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 8. August 1918. Pp. 375-379.

The comparative rarity with which dilatation of the oesophagus is encountered by practitioners induces Fey to record a case he recently saw in a cow. The literature contains the account of only a few cases, mostly in the horse, more seldom in the ox and dog. The condition begins as a more or less uniform increase in the lumen of the tube

(*dilatatio œsophagi*) and develops into a sac-like diverticulum (*diverticulum œsophagi*). The original cause of the diverticulum is variable, such as œsophageal stenosis, obstruction, tumour or abscess formation, parasites, loss of elasticity of the œsophageal wall from lesion of the vagus nerve, etc.; but in all cases it may be asserted that the production of the diverticulum is secondary.

The symptoms vary with the position of the dilatation and with the individual case. If the diverticulum is in the cervical part of the tube the local swelling determines the diagnosis even at a distance. If the dilatation occurs in the thoracic part of the œsophagus, other symptoms must naturally be sought. There may be disturbance of deglutition, and possibly antiperistaltic movements or vomiting; but the symptoms vary in different cases and are never of a fixed character.

The case which is here recorded occurred in a cow two and a half years old, which, it was stated, started a meal by eating well but soon stopped and became uneasy. Frequently large masses of food were regurgitated. The general condition of the cow was poor, and she had an occasional cough. The pulse, temperature, and cardiac action were normal. There was distension of the abdomen, without, however, any increased sensitiveness or indication of peritonitis. Physical examination of the chest led to the diagnosis of left pulmonary tuberculosis, with involvement and enlargement of the mediastinal glands.

On post-mortem examination the diagnosis of tuberculosis was confirmed, and in addition a considerable dilatation was discovered at the commencement of the thoracic portion of the œsophagus. The wall of the distended œsophagus was very thin, but the mucosa and the muscular coat of the tube were everywhere intact. At the point where the distension gave place to normal œsophagus there was a radiate scar, probably the remains of an injury inflicted with a probang. The stricture which followed the injury was doubtless the cause of the distension.

DIETETICS.

REPORT ON CALF-FEEDING EXPERIMENTS. W. G. R. PATERSON. *Bull. No. 84. West of Scot. Agric. Coll. 1918. Pp. 15-23.*

These experiments were carried out with a view to gaining further information as to the best and most economical methods of rearing calves, particularly in cheese-making districts, where plenty of whey would be available. At the present time as many calves as possible should be reared, but it is equally important that the minimum amount of whole milk be used for the purpose.

The experiments conducted at the college in 1914 and 1915 (this *Review*, 1917, I. 16) showed that the cost of rearing calves on whole milk was prohibitive. It was further shown that, provided the calves received whole milk for the first four weeks, separated milk and crushed oats or maize meal formed suitable, reliable, and economical rations. Calves so fed had almost as satisfactory live-weight increase as those fed solely on whole milk. Further experiments with which this report deals were carried out in 1916 and 1917; sixteen calves were used each year, being divided into four groups. They were fed on whole milk for the first three weeks of their lives, and thereafter were gradually put on to the trial rations, a transition period of three weeks being allowed before the milk was entirely stopped.

During the season 1916 the rations tested were: separated milk and crushed oats; whey, oatmeal, and fish meal; whey and palm-nut meal; water and palm-nut meal. In 1917 the same rations were tested, except that the water and palm-nut meal, which proved unsatisfactory, was replaced by whey, fine thirds, and fish meal. In both years the experiment lasted for a period of twelve weeks from the whole-milk period, so that the calves were fifteen weeks old when the investigation was concluded.

The separated milk and crushed oats was looked upon as the control ration. Hay was given when the calves were five weeks old and linseed cake at eight weeks. The calves fed on separated milk and crushed oats made fully the best progress, but the comparative cost of this ration per live-weight increase rules it out where whey is available. Further, on account of the necessity for reserving both whole and separated milk for human consumption, this method of feeding cannot be recommended at the present time. There is comparatively little difference in the results from the other three rations. It is to be noted that the change from whole milk to whey must be effected gradually.

Apart from the separated milk and crushed oats ration, the writer prefers that composed of whey, oatmeal, and fish meal, but he points out that as oatmeal is one of our staple foods, and that as neither palm-nut meal, fine thirds, nor fish meal is used directly for human food, these should be employed for preference. (R. G. L.)

A STUDY OF THE PHYSICAL CHANGES IN FEED RESIDUES WHICH TAKE PLACE IN CATTLE DURING DIGESTION. P. V. EWING and L. H. WRIGHT. *Journ. Agric. Res.* Vol. XIII., No. 12. 17th June 1918. Pp. 639-646. 7 Tables.

These observations were noted while studying the rate of passage of food residues through the steer (this *Review*, 1917, I. 367). Cotton-seed

meal and maize silage were specially prepared so that both foods were of a definite size when ingested; thus the silage was 100 per cent. over 2 mm. and the meal contained no particle over 2 mm. The authors were able to study the comminution of the silage as it occurred throughout the digestive tract in the first instance when this food was given alone and again when combined with cotton-seed meal. It is concluded that more than half of the comminution that takes place in average rations containing coarse foods takes place as a result of mastication; with incomplete mastication a higher percentage of the comminution takes place in the rumen and reticulum. About the same extent of comminution takes place in the omasum and abomasum. The amount of comminution is not alone dependent on the time food residues remain in the several organs, but is also dependent on the functional activity of the organs.

Absorption takes place to the greatest extent in the intestines.

Absorption tends greatly to lessen the quantity of residues below 2 mm. and proportionately to increase that above 2 mm. The comminution of silage-alone rations during the process of digestion is over 90 per cent. efficient, with 2 mm. as the dividing line.

(R. G. L.)

THE COMPOSITION AND FOOD VALUE OF BRACKEN RHIZOMES.
J. HENDRICK. *Scottish Journ. Agric.* Vol. I., No. 4. October
1918. Pp. 423-430. 2 Tables.

Estimations were made of the quantity of bracken rhizomes that can be gathered from an acre of bracken-covered land. From a little over 15 tons to as much as 53½ tons were lifted.

In many instances the nature of the land will prevent the economic gathering of the crop. The composition of the rhizomes varies with the season; that is, with the state of growth or quiescence of the plant. Apparently as growth proceeds the percentage of protein and soluble carbohydrates becomes less, with a corresponding increase of fibre. The average of several analyses for the natural and dried state is as follows:—

	Crude Protein.	Fat.	Carbo-hydrates.	Fibre.	Ash.	Moisture.
Natural . .	2·19	0·26	13·01	6·02	2·52	76·00
Dried . .	9·10	1·06	54·38	25·12	10·34	...

Feeding experiments are being undertaken and some observations have already been made.

(R. G. L.)

A STUDY OF THE CHARACTER OF THE FECES DUE TO VARIOUS FOODS IN CONNECTION WITH ANTHELMINTIC INVESTIGATION. M. WIGDOR.
Amer. Journ. Vet. Med. Vol. XIII., No 9. September 1918.
Pp. 441-444.

It is a matter of importance to know whether the faeces are such as would be expected after a particular kind of food, or are altered as the result of some particular condition. The author, therefore, states the results of his observations on over a hundred dogs, in the following summary :—

“ Soft, light-coloured, plentiful faeces are indicative of a bread diet. Dark, fairly hard faeces in comparatively small amounts are indicative of a raw-meat diet. Very dark, fairly soft faeces in small amounts are indicative of a finely chopped cooked-meat diet. (This seems to be especially true when the meat is fed while still warm.) Clay-coloured, brittle faeces in small lumps are indicative of some bone constituent in the diet. Therapeutic doses of oil of chenopodium or distillation products of oil of chenopodium, when given with castor oil, usually cause greenish, fluid faeces, regardless of the diet. Excessive or lethal doses of chenopodium constituents cause constipation, in spite of therapeutic doses of castor oil, defaecation being suppressed for a period of one or more days or the faeces being hard and dark.”

PORK PRODUCTION IN NORTH DAKOTA. W. H. PETERS and D. J. GEIKEN.
Bull. No. 127. North Dakota Agric. Exp. Station. July 1918.
Pp. 255-278. 13 Figures, 4 Tables.

“ Using the home-grown feeds commonly available in North Dakota, when pigs are fed in the dry lot, from $4\frac{1}{2}$ to $5\frac{1}{2}$ lbs. of grain are required to produce 1 lb. of pork. When any one of a number of suitable pastures are provided, the amount of grain required to produce a pound of pork can easily be reduced to from $2\frac{1}{2}$ to $3\frac{1}{2}$ lbs. Alfalfa has proven at one and the same time to be the most palatable, the most productive, and the most permanent type of hog pasture that can be provided. Oats, barley, fall rye, and rape make satisfactory pig pastures; but because of the short period through which they are available they are not economical crops to grow for hog pasture. The results of experiments so far conducted at this station do not justify the use of the self-feeder as an economical method of feeding growing pigs while on pasture. The practice of hogging off the early maturing varieties of corn through the fall months has proven practical and profitable. The practice of hogging off Canadian field peas after they have ripened has proven practical and profitable. The feeding of good

alfalfa hay to brood sows in winter has proven decidedly beneficial and profitable, making possible a saving of from one-fourth to one-third the amount of grain that would otherwise be required."

GENETICS AND HEREDITY.

STUDIES IN INHERITANCE OF CERTAIN CHARACTERS OF CROSSES BETWEEN DAIRY AND BEEF BREEDS OF CATTLE. J. W. GOWEN. *Journ. Agric. Res.* Vol. XV., No. 1. 7th October 1918. Pp. 1-57. 6 Plates (17 Figures), 30 Tables.

An effort is being made to find evidence necessary to the final solution of the problems which are connected with the inheritance of milk and butter-fat production. A cross-bred herd is being formed at the Maine Agricultural Experiment Station, the following breeds being available for this purpose:—Holstein-Friesian, Guernsey, Jersey, Ayrshire, Polled Angus. The present paper analyses the inheritance of the more prominent character of the first generation of the cross-bred herd.

Black body colour is dominant to the other colour in the first generation. White marking of the body taken as a whole appears to be dominant. Study of the individual white areas, however, indicates that this is due to white in the inguinal region only, for this alone appears as such a dominant. White spots on the face, neck, shoulders, rump, flanks, and legs are, in general, suppressed in their offspring when such animals are mated to solid colour. As has been suggested, but as has never been tested before, the pigmented muzzle is dominant to the one not so pigmented. A pigmented tongue is dominant to a non-pigmented one. A black switch appears to cause the suppression of the other switch colours in the offspring. Horned animals have been crossed with polled, and the results suggest that the testes have some action on the presence or absence of horns.

"The qualities of beef production are shown to be divisible into four general regions of the body: head, forequarters, barrel, and hind-quarters. The type of head and heavy, deep-fleshed forequarters are transmitted to the offspring when either parent is of the Aberdeen-Angus breed. The body and hindquarters appear intermediate, but resemble most the dairy parents.

"Data are given on the milk and fat production of some of the cross-breds. The results indicate that milk and fat production behave separately. High milk production is dominant to low, but high fat production is recessive to a low fat percentage in the milk."

HYGIENE AND PREVENTIVE MEDICINE.

GERM CONTENT OF MILK. I. AS INFLUENCED BY THE FACTORS AT THE BARN. II. AS INFLUENCED BY THE UTENSILS. M. J. PRUCHA, H. M. WEEVER, and W. H. CHAMBERS. Univ. Illinois Agric. Exp. Station. *Bull. No. 199*. May 1917. Pp. 23-55. 3 Figures, 18 Tables. *Bull. No. 204*. February 1918. Pp. 217-257. 1 Figure, 25 Tables.

The New York Agricultural Experiment Station having shown that byre conditions have but a slight effect upon the germ content of milk, these two inquiries were undertaken to test independently this new idea. Three byres were used—one being excellent, the second good, while the third was distinctly bad. The floor of number three was of earth, the cows wandered about at will, being tied up only at milking, and the manure was removed every six months. While the germ content of the individual samples varied from 3 to 218,250 bacteria per c.c., the large majority of the samples in all three barns had a low germ content.

The average germ content of all the milk produced during the entire period—spring of 1914 and 1915—was 2639 per c.c. in byre 1, 920 in byre 2, and 5777 in byre 3. It would seem, therefore, that it is possible to produce milk with a germ content of less than 10,000 per c.c., even in byres such as number three, provided that the utensils are clean.

The second paper shows quite plainly that it is the utensils rather than the byres that call for notice. One experiment showed that when all the byre and dairy utensils were properly steamed the bottled milk had uniformly only about 5000 bacteria per c.c., but as soon as steaming was omitted the milk frequently contained several hundred thousand bacteria per c.c. Transport cans are particularly dangerous: it was found that the addition of a million bacteria per c.c. of milk was not uncommon. Of the dairy utensils the greatest contamination comes from the most complex appliances, such as the clarifier and bottle-filler.

In one experiment it was found that the pails added eleven times as many bacteria to the milk as the byre influences, the strainer one and a half times as many, the clarifier thirty times, the cooler ten times, and the bottle-filler sixty times as many—a total of 112 times as many added by the utensils as by the byre factors. (R. G. L.)

THE EXAMINATION OF TINNED MEAT (*Zur makroskopischen und bakteriologischen Untersuchung und Beurteilung von Büchsenfleisch*). W. FREI and A. KRUFSKI. *Schweizer Arch. f. Tierheilk.* Vol. LX, No. 10. October 1918. Pp. 445-470.

According to the experience of the writers, the different possibilities

which may be met in the examination of tinned meat, may be summarised as follows :—

- A. The tin is of normal appearance, impervious, and without bulging :
 - 1. Contents macroscopically normal and bacteriologically sterile.
 - 2. Contents macroscopically normal, bacteriologically infected.
 - 3. Contents abnormal in colour, consistence, odour, or taste :
 - (a) Sterile, by action of the ingredients of the wall of the tin.
 - (b) Infected.
 - B. Pervious tin :
 - 1. Contents macroscopically normal.
 - 2. Contents macroscopically spoiled :
 - (a) Not offensive-smelling.
 - (b) Offensive-smelling.
 - C. Tin destroyed :
 - 1. Contents macroscopically normal and sterile, from action of the metal.
 - 2. Contents macroscopically normal :
 - (a) Not offensive-smelling.
 - (b) Offensive-smelling.
 - 3. Contents macroscopically altered :
 - (a) Not offensive-smelling.
 - (b) Offensive-smelling.
- With
or
without
gases.
- Odourless
or
offensive-
smelling.
- Infected in
all cases.
- Infected.

INFECTIOUS DISEASES.

INFECTIOUS ANEMIA OF HORSES. A. G. FEERS. *Amer. Journ. Vet. Med.* Vol. XIII., No. 11. November 1918. Pp. 527-533.
10 Figures.

Suspecting that rats may be concerned in the transmission of infectious anaemia of horses, the author killed and examined rats from a barn in which an outbreak took place, and found lesions in some resembling those found in horses affected with swamp fever. His experience leads him to think that mosquitoes also play some part in transmission. In a stable housing a hundred animals, the horses, which seemed to be in a fair condition in the beginning, failed considerably after mosquitoes had annoyed them for four weeks. After screening all the windows and keeping the horses in the stable at night, they improved to a certain extent under treatment.

The author gives an account of the post-mortem lesions he has discovered in the examination of a number of cases. In the matter of treatment, he does not claim to have discovered any specific for the disease, but has had gratifying results from various forms of treatment.

Of various drugs, the most satisfactory have been preparations of arsenic, iron, and quinin; but Fowler's solution of arsenic has not given any good results. Sodium eacodylate has been satisfactory, as has also a 6 per cent. solution of phenol to which has been added sufficient potassium bichromate to make the solution a dark straw colour. This mixture has been given in food three times a day. Neither the phenol nor the potassium bichromate alone gave good results. Trypan blue alone produced no beneficial effects, nor did mixed infection serum.

"Blood transfusion from a healthy mare into a swamp fever patient of the anaemic type produced noticeable and permanent improvement. In another instance, blood transfusion from a horse into two different animals produced material benefit in twenty-four to forty-eight hours, which was permanent also."

RINDERPEST IN ERITREA.

1. "Comportamento biologico del piroplasma bigeminum nei bovini della Colonia Eritrea (Norme che ne derivano per la practica della siero-vaccinazione contro la peste bovina)." G. DI DOMIZIO. *Il Moderno Zooiatro*. Parte Sci. Ser. V., Vol. VI., No. 10. October 1917. Pp. 232-236. *Ibid.* No. 11. November 1917. Pp. 247-259. 1 Figure.
2. "Intorno alla profilassi della peste bovina in particolare e alla lotta contro i morbi infettivi del bestiame in generale in Colonia Eritrea." G. DI DOMIZIO. *Ibid.* Vol. VII., No. 1. January 1918. Pp. 20-24. *Ibid.* No. 2. February 1918. Pp. 35-48. *Ibid.* No. 3. March 1918. Pp. 60-72. *Ibid.* No. 4. April 1918. Pp. 84-96. *Ibid.* No. 5. May 1918. Pp. 107-120.

1. In his first paper, Di Domizio points out that *Piroplasma bigeminum* is so prevalent in Eritrea that practically all bovines harbour the organism at some time or other in their lives. Though the detection of the parasite is difficult under ordinary conditions, in cases of rinderpest there is no difficulty. The possible presence of the *Piroplasma* in the blood used for inoculation against rinderpest renders necessary great precautions that the serum used for inoculation should be pure. The best way of ensuring this is to take the serum on the fourth or fifth day of the disease, when the circulating blood contains active rinderpest virus but no *Piroplasma*, or so few as to render their detection by the microscope impossible. On the sixth or seventh day the rinderpest virus is more attenuated, and *Piroplasma bigeminum* is probably present in the blood in greater numbers and in a more virulent form. On these days, therefore, the serum should not be taken.

2. Di Domizio's observations in 1912 and 1913 has confirmed the statement of Zonchello to the effect that the simultaneous method of Kolle and Turner when employed in Eritrea has always caused the diffusion of rinderpest, and has not proved useful in prophylaxis. This is not because of any fault of the method, but because the vaccination has been carried out spasmodically and partially, and in such a manner as to leave not less than half of the bovine population receptive to rinderpest.

Ordinary measures of sanitary police (isolation, disinfection, etc.), if scrupulously applied, might limit the ravages of the disease, but only for a time. Such measures would not be sufficient to guarantee Eritrea against an invasion, with disastrous consequences, of rinderpest from Abyssinia. Of all known means of combating the disease in Eritrea, that of active immunisation by the method of Kolle and Turner holds out the best prospect of success, when combined with sanitary measures scrupulously carried out. But sero-vaccination needs to be applied to all the bovines in the colony in the shortest possible space of time, and it must be repeated every three or four years to prevent the development of the disease in new animals. The whole of the vaccination must be effected in the space of a few months.

THE VIRULENCE OF THE BLOOD IN FOOT-AND-MOUTH DISEASE, AND
ATTEMPTS AT IMMUNISATION (Sur la virulence du sang des
bovidés aphéteux et essais d'immunisation contre la fièvre
aphéuse). G. COSCO and A. AGUZZI. *Rev. Gén. Méd. Vét.*
Vol. XXVII., No. 318. June 1918. Pp. 233-240.

In ordinary aphthisation, if a certain quantity of very virulent material taken from recent lesions of foot-and-mouth disease is used, the period of incubation may be reduced to twenty-four hours or even less. On an average it is two to five days. By the subcutaneous inoculation of very virulent red blood corpuscles (second or third passage) the period of incubation may be about seventy hours, but never shorter; while if corpuscles of less virulence be employed incubation may last from five to seven days. Almost the same results are obtained by inoculation with virulent blood-serum.

The fever is of a remittent type, and is preceded, an hour before its manifestation, by staring of the coat, muscular tremors, and diminution or suppression of appetite. The elevation of temperature is 2 to 2.5° C. above the average normal. The febrile periods succeed each other every twenty-four hours.

In a typical case the first febrile period is not accompanied by any aphthous manifestations. At the second period one or two vesicles

appear in the mouth and on the feet, which, rupturing, remain stationary until the next febrile period, when other vesicles are developed. This goes on to the fourth, or sometimes the fifth, period.

It has been found that, in the majority of cases, the virulence of the red blood corpuscles attains its maximum at the commencement of the second or third febrile period. It diminishes gradually during the elevation of temperature and while the temperature is at its height, and disappears during the fall of the temperature. The blood-serum, however, attains its maximum virulence about the time of the highest temperature. Observations prove that the virulence of the erythrocytes is not due to the adhesion of small quantities of serum after washing.

The authors have been able to show that the intravenous inoculation of virulent corpuscles has the prospect of being a good practical method of producing an active immunisation. Of sixteen bovines which received a single intravenous injection, all, with the exception of one, remained immune against the disease for two months, although exposed to natural infection which produced the disease in all the animals used as controls. Though the results of these experiments may not be definite, the authors hope to be able to improve upon them and determine certain points, such as the necessary dose of corpuscles of known virulence, the number of injections necessary, the space of time which should be allowed to elapse between the injections, etc.

INFECTION OF NEW-BORN CALVES AND SERO-PROPHYLAXIS (Le infezioni di stalla dei vitelli neonati e la loro siero-profilassi). P. STAZZI.
La Clinica Vet. Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 414-425.

The infection with which this article is concerned manifests itself in three forms in the cases which have been studied in Lombardy. (1) Diarrhoea or dysentery is the commonest form. There is a catarrhal or haemorrhagic gastro-enteritis with involvement of the mesenteric lymph glands. (2) Polyarthritis with serous effusion into the joint-cavity. (3) Broncho-pneumonia, known in Lombardy by the name of *coradella*. This is the least frequent form of the disease, and the one which gives rise to the lowest mortality. The first two forms of the infection are generally manifested on the first day after birth, and are of the nature of a colibacilosis of a septicemic character. Broncho-pneumonia appears later (in from fifteen to twenty days after birth), and is a localised colibacilosis, the *B. coli* being absent from the blood and present only in the lungs.

Observations show that infection is due to *B. coli* in about 95 per

cent. of cases. In the bacteriological examination of material from 300 cases, *B. paratyphosus B* was discovered six times in dysenteric forms of the disease, and a streptococcus three times in cases of polyarthritis.

As a means of prophylaxis, a polyvalent anti-serum has been prepared by using the greatest possible number of strains of *B. coli* isolated from cases of the disease. From 1913 to 1918 11,150 doses of the serum have been used, with satisfactory results. As prophylaxis against extra-uterine infection (by the digestive tract or by the umbilicus) one or two injections of 20 c.c. are given subcutaneously, intramuscularly, or into the peritoneal cavity. In rare enzootics of intra-uterine infection it is necessary, in order that the mortality may be arrested, that the mother should receive an injection of 40 to 80 c.c. of the serum some days before parturition; ordinary inoculation (preferably into the peritoneal cavity) of the calf being also practised. The serum gives the best results (100 per cent. of protections) when it is prepared with the same strains as those which cause the enzootic.

[In connection with colibacillosis and broncho-pneumonia of calves, see also Cominotti, *La Clinica Vet.*, 1918, xli. 167; this *Review*, 1918, II. 312.]

EXPERIMENTAL PREVENTION AND CURE OF EXUDATIVE PLEURO-PNEUMONIA
OF GOATS BY MEANS OF A SPECIAL SERUM (Di un esperimento
ufficiale di prevenzione e di cura della pleuropolmonite essudativa
delle capre mediante un particolare siero ricavato dall'essudato
pleurico specifico). N. MORI. *Il Moderno Zootro.* Parte Sci.
Ser. V., Vol. VII., No. 9. September 1918. Pp. 193-200.

In the summer of 1915 a pleuro-pneumonia made its appearance among goats in certain parts of Italy. There is reason for supposing that the disease, absolutely unknown up to that time in Italy, was imported from the opposite coast of the Adriatic; for there was then, and had been for a long time, in Albania, Montenegro, and Serbia, a disease of goats identical with that which was observed in Apulia, Basilicata, and Latium.

In an earlier publication, Mori has reported the beneficial prophylactic and curative effects following the subcutaneous injection of the serous exudate collected aseptically. The present communication reports further evidence to the same effect. Exudative pleuro-pneumonia can be prevented by the subcutaneous injection of the serum in doses of 1·5 to 2 c.c. in sucking goats, and 2·5 to 3·5 c.c. in adult animals, the dose varying according to age and state of nutrition.

of the animal. The curative dose ranges from 3·5 to 4·5 c.c. There is no need for a second injection.

[For a note on Mori's previous article, see this *Review*, 1917, I. 252.]

THE INTRADERMAL PALPEBRAL MALLEIN TEST (Observations relatives à l'intra-dermo-malléination palpébrale comme méthode de diagnostic de la morve). A. LOUIS and D. LECOMPTE. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 320. August 1918. Pp. 361-368.

In discussing the diagnostic value of the intradermal palpebral mallein test, Drouin and Naudinat (*Rev. Gén. Méd. Vét.*, 1914) drew attention to the possibility that oedema may be confined to the lower eyelid, with hardly any inflammation of the conjunctiva, and a limpid (not muco-purulent) discharge. They contended that such reactions should cause the horse to be considered as "suspect," and that, by way of control, the subcutaneous test should be applied. A ministerial circular, dated 23rd December 1914, authorised the employment of the intradermal palpebral method of diagnosis and indicated that an inconclusive reaction should be followed by the subcutaneous test.

In the present communication, Louis and Lecompte give particulars of a number of cases in which the palpebral test has given a doubtful or incomplete reaction in animals shown to be suffering from glanders by other methods of diagnosis. In one case the intrapalpebral injection of mallein never gave a clearly positive reaction, though positive evidence of the presence of glanders was afforded by the subcutaneous test, by intraperitoneal injection into male guinea-pigs of material derived from closed lesions, and by serological tests. The post-mortem examination confirmed the diagnosis.

All their observations, therefore, confirm the contention of Drouin and Naudinat and the instructions contained in the official circular: "Any animal presenting, thirty-six hours after injection, a more or less marked and persistent oedema confined to the lower eyelid, is to be held as 'suspect' until the diagnosis is controlled by the subcutaneous injection of mallein."

THERAPY OF GLANDERS.

1. "Relazione sugli studi fatti a Brian per la terapia della morva." E. BERTETTI and G. FINZI. *Il Nuovo Ercolani*. Vol. XXIII., No. 17. 15th September 1918. Pp. 209-219. *Ibid.* No. 18. 30th September 1918. Pp. 225-237.

2. "Relazione finale che la Commissione di Controllo per gli studi sulla terapia della morva presentó a S.E. il Ministro della Guerra." *Ibid.* No. 21. 15th November 1918. Pp. 259-266.

1. The development of glanders among the horses of the Third Italian Army during the first year of war, and the remarkable number of animals that had to be cast in consequence of reaction to the mallein test, suggested the idea of using these horses for experiments on the curability of the disease. A certain number were treated with phenol, iodo-iodide solution, arsenical and mercurial preparations, and luargol of Danysz. With most of these chemical substances there was no success. Of seven cases treated with luargol two were cured, but this is regarded as of no importance from the practical point of view. The results were too uncertain, the cure required eight to nine months, and, even if luargol could be considered a specific, the cost would be excessive.

A larger number of cases were treated with mallein (specially prepared, and named "Brian" mallein, from Brian in the Province of Venice, where the laboratory was situated), sensitised mallein, bacilli killed by a chemical substance, bacilli killed by heat, the simultaneous injection of killed culture and "Brian" mallein, "Brian" mallein and anti-glanders serum, killed culture and sensitised anti-glanders serum, concentrated and sensitised "Brian" mallein, sensitised vaccin and "Brian" mallein, and anti-glanders serum and killed culture.

Cures were effected with most of these methods, but the most satisfactory results were apparently obtained with the specially prepared mallein, with which cure was obtained in from 45 to 294 days.

2. The committee under whose control the above investigations were conducted have presented their final report to the Italian Minister of War. They state that all the horses claimed to have been cured and all the control animals without exception have been placed at their disposal. All the animals were subjected to the intrapalpebral mallein test, which was negative in those animals stated to have been cured of glanders, and positive in the control animals. Ten of the "cured" horses were killed; post-mortem examination revealed nodules in organs referable to a mucoid process. Six control animals were also destroyed, and active glanders lesions, in full evolution, were found. Material from the ten "cured" horses was inoculated into ten donkeys and forty male guinea-pigs, with negative results. Material from the six control horses was inoculated into three donkeys and forty-two guinea-pigs, and glanders infection was induced. Serological tests confirmed fully the diagnostic results produced by inoculation. The Commission declare, therefore, that the horses stated by Bertetti and

Finzi to have been cured of glanders must be considered as having been effectively cured.

LOUPING-ILL. Sir S. STOCKMAN. *Journ. Comp. Path. and Therap.*
Vol. XXXI., No. 3. September 1918. Pp. 137-193. 10
Figures.

In an earlier communication, Stockman (*Journ. Comp. Path. and Therap.*, 1916, xxix. 244-264; this *Review*, 1917, I. 39) gave the results of experiments designed to show the relation of ticks to the transmission of louping-ill, and concluded therein that the relationship was not, up to that time, proved. In the light of further experiment he concludes differently. From later results it follows "that larvae from females which as adults engorged on affected sheep can give rise to a highly febrile and sometimes fatal disease in other sheep, when put to feed upon them in very large numbers, and that adults fed as nymphs on affected sheep may have the same effect. It is possible that the apparently negative results recorded in the first article arose owing to the circumstance that only a small proportion of ticks become carriers of infection, but it is also probable that neglecting to take temperatures explains some of the apparently negative results. The blood and the juice of oedematous lymph glands from cases arising from experimental inoculation . . . and from infestation by ticks . . . can cause similar lesions when inoculated to other sheep in series. Ticks allowed to engorge on these experimental cases during the (febrile) reaction can, after moulting to their next stage, cause the disease in other sheep upon which they are put to feed. It follows that the infective agent, whatever it is, can be transmitted from the female ticks through the eggs to the next generation of larvae; but, although the positive results so far have been obtained with larvae and adults, it does not follow conclusively from the results available that the ticks in their nymphal stage cannot also transmit the disease."

In both the naturally acquired and the experimental disease the symptoms may vary from those of indisposition to those of serious illness, with fatal paralysis and coma. In milder attacks many sheep never show symptoms visible to the ordinary observer. The only macroscopic lesions observed in the examination of a large amount of material, and in the severest cases, were oedema, and very occasionally congestion, of groups of lymph glands, and less frequently superficial haemorrhage in some part of the brain or the anterior part of the spinal cord. Microscopic examination of the brain and spinal cord reveals lesions of varying degrees referable to a pathological condition describable as myelo-encephalitis. Smears of the juice from oedematous

lymph glands, and blood-smears, treated with Giemsa's stain, show chromatin bodies in some of the mononuclear cells. It is not claimed that a final statement can be made that the chromatin bodies are protozoan parasites and the causal agent of louping-ill, but reasons are adduced in support of such a view:—“(1) The disease is tick-borne. (2) Inoculation with the fluids and organs of sheep containing the bodies reproduces the disease. (3) The bodies stain after the manner of such parasites. (4) The causal agent is apparently not ultra-microscopic (the infective agent appears to be retained by bacterial filters), and the bodies are the only abnormal objects observable under the microscope in materials which convey the disease by inoculation. (5) The virulent material, if perfectly fresh, is sterile as regards bacteria.”

The blood of a sheep which has recovered from the disease produced by inoculation does not continue to be infective, nor is the material from a chronic case of the natural disease. A sheep which has passed through the febrile reaction induced by inoculation is protected to a very considerable extent against the effects of a subsequent inoculation, in the same way that a sheep which has recovered from an attack of the natural disease is highly resistant to further attacks. A small number of the inoculation animals survived exposure in the following season on louping-ill infected pasture, while 33·3 per cent. of other sheep not so inoculated, and exposed on the same pasture, died of typical louping-ill. The blood of healthy sheep when inoculated in large amount to other sheep does not produce a reaction.

Atoxyl, arsacetin, novarsenobillon, and trypan blue were tried as curative agents in both natural and experimental infections, but with inconclusive results. Though the disease induced by the inoculation with the blood of affected animals is milder than that arising from tick infection, and experiments show that considerable resistance follows the former, it would be unwise to be too hopeful of preventive inoculation until its applicability to field conditions has been tested on a large scale. The methods of tick-eradication are to be the subject of a later article.

NECROBACILLOSIS IN SWINE. R. GRAHAM. *Circular No. 222.* Univ. Illinois Agric. Exp. Station. June 1918. Pp. 12. 7 Figures.

Four distinct forms of necrobacillosis are recognised in pigs:—(1) necrotic stomatitis, canker sore mouth, or infectious sore mouth; (2) necrotic rhinitis, sniffles, or bull nose; (3) necrotic enteritis; and (4) necrotic dermatitis. The *Bacillus necrophorus* is a normal habitant of the alimentary tract of pigs, and may be found in soil or

feeding-stuffs contaminated with their dung. It does not attack intact, healthy tissue, but is a secondary invader of tissues of lowered vitality or those injured by mechanical agency. An animal may suffer from one or more forms of the disease, but as a rule one form predominates in a herd. The association of necrobacillosis with swine fever has been recognised for many years, but its full economic importance has only been appreciated as the result of observations which have shown the increasing prevalence of the disease and its possible independence of swine fever. In some districts the loss from necrobacillosis is greater than that from swine fever. Sucking-pigs are especially susceptible immediately after birth, during teething, or during the first few weeks of life.

The disease in pigs may assume an acute form terminating fatally in a few days; or it may be slow and chronic, the affected animals living for several weeks or even months. Spontaneous recovery is possible in mild cases. Adult animals are highly resistant and only occasionally contract the disease. Nursing sows may suckle affected young and still escape. Not infrequently the young do not become infected until the time of weaning, with the result that pigs from two to four months old are often the victims. The loss depends upon the resistance of the animal and the virulence of the infection, as well as upon the extent and locality of the lesions. In some herds the losses are negligible, while in others they may be as high as 100 per cent. The disease is rarely spread by direct infection from animal to animal, but the premises are contaminated by the excrement, nasal discharge, saliva, and discharges from superficial skin lesions of sick animals.

In necrotic stomatitis there is a progressive, deeply penetrating ulceration accompanied by the formation of a dry, yellowish exudate, covered by a greyish-brown scab. The ulcers are local and circumscribed, but may coalesce to form diffuse patches. The necrotic tissue has a characteristic offensive odour. In mild infections the local lesions may heal spontaneously.

Necrotic rhinitis not infrequently follows ringing, but infection may result from exposure to cold or injury inflicted in rooting in the soil. The disease primarily involves the mucous membrane of the nose, but may extend to the bony or cartilaginous tissues. Excessive secretion of mucus diminishes or occludes the nasal passages and produces difficulty in breathing. Expiratory efforts expel mucus mixed with particles of necrotic tissue. The disease may extend to the air sinuses and pharynx, and inhalation of fragments of necrotic tissue may lead to necrotic pneumonia.

"Necrotic enteritis is the most fatal form of necrobacillosis and can be recognised only on post-mortem examination. The lining of the wall

of the large or small intestine may be diffusely involved and covered with a yellowish-white, cheese-like material, which is detached from the underlying tissue by gentle scraping. The wall of the intestines becomes thickened, and the inflammatory exudate adhering to the inner lining interferes with digestive and absorptive functions and results in mal-nutrition, diarrhoea, and emaciation. A restive attitude associated with various nervous symptoms, such as spasms, holding the head to one side, and walking or running in a circle, is commonly observed in this type of necrobacillosis. Growth and development are retarded indefinitely, the abdomen is drawn up, abnormal excretions collect and dry on the surface of the skin, giving it a wrinkled appearance, and death results from starvation and absorption of waste products of metabolism or of products of decomposition within the intestine." Mild cases may recover spontaneously. The condition may be mistaken for swine fever, and may be associated with this disease. Differentiation between the two diseases is generally based on the characters of the ulcers. In necrobacillosis the necrotic areas are diffuse and not elevated above the general surface, while in swine fever the ulcers are circumscribed, well-defined, and elevated above the surface of the intestinal mucous membrane. The injection of anti-swine-fever serum produces unfavourable results in a case of necrotic enteritis, and similar irregular results may be produced by the injection of the serum in cases of swine fever if this disease is associated with necrotic enteritis.

Necrotic dermatitis may occur on any part of the body, and in young pigs it may cause sloughing of the tail and ears. It is most commonly observed about the feet, legs, and face. "Metastatic abscesses in the subcutaneous tissue in the regions of the shoulder, inner side of the forelegs, thigh, and neck are occasionally associated with necrotic dermatitis, while the liver and other internal organs may be the seat of abscess formation. The abscesses in the subcutaneous tissue may be soft, containing a semi-liquid, yellow, creamy pus or a lumpy, semi-solid, dry, cheese-like substance with a characteristic disagreeable odour."

The *Bacillus necrophorus* may invade the general circulation, and haemorrhagic spots on the kidney and on the surface of the lungs may be found which closely resemble those of swine fever. "The surface of the liver may show distinct, yellowish-white spots, or even visible abscess formation. Encased abscesses in the lungs have been mentioned, together with adhesions of the lungs to the chest wall."

Mild cases of certain types of the disease may yield to treatment, but curative agents are not always satisfactory and afford only temporary relief. Efficient control depends upon isolation, cleaning and disinfecting piggeries and feeding places, and change of pastures.

CONTAGIOUS AGALAXY.

1. "Sull' efficacia preventiva e curativa del siero antigalassico Marra. Nota preventiva." O. RUATTI. *Il Nuovo Ercolani*. Vol. XXIII., No. 16. 31st August 1918. Pp. 193-199.
2. "Contribution à l'étude de l'agalactie contagieuse des chèvres et des moutons." PÉRUSSET. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 403-412. 12 Figures.

1. In 1913 Dr. Rocco Marra introduced a vaccin and a serum for the treatment of contagious agalaxy in goats, and indicated that his serum was not only curative but also capable of conferring immunity. Ruatti, in the present communication, relates his experience with the use of the serum in an outbreak of the disease among a herd consisting of sixty-two milking goats, twenty-two kids, and one he-goat. In the animals affected mammary, ocular, and articular lesions were represented. To the healthy members of the herd he administered an injection of 10 c.c. of Marra's serum as a prophylactic, and to the affected animals he gave doses of from 30 to 50 c.c., according to the gravity of the lesions. In those cases in which there was involvement of the eye, he also instilled serum into the conjunctival sac. From the results obtained, Ruatti believes that he is justified in concluding that Marra's serum, in 10-c.c. doses, is capable of conferring an active immunity against contagious agalaxy, and that its employment is particularly indicated as a means of arresting an epidemic. He is further convinced that the injection of from 30 to 50 c.c. of the serum has undoubtedly a curative effect, and that, by its means, grave organic lesions are affected in such a manner that the organs (eye, joints) are restored to a normal condition. In serious eye involvement (ulcerative keratitis) the serum should be applied locally as well.

2. Pérusset's experience of contagious agalaxy has been acquired by the study of the results of the introduction of five cases into a healthy herd. These goats were on the way to recovery when purchased, and it was feared that, consequently, little would be discovered in connection with the transmissibility of the disease. But a considerable proportion of the experimental herd contracted the disease, thus supporting the contention of Carré to the effect that virulence is of long duration, and refuting the assertion of Celli and Blasi that the virus is only disseminated during the earlier stages of the disease. The author goes into details respecting the lesions observed in three cases of the disease transmitted to experimental animals—two by cohabitation and one by inoculation.

The author's experimental animals demonstrated the fact that in goats which have recovered from the disease the atrophied mammary

glands become absolutely normal after the next parturition. "All the goats after parturition presented regenerated mammae and gave absolutely normal milk, save in one single case." In barren animals the mammary gland remains atrophied, as it does also in those animals which abort during the first period of gestation. In goats which abort during the second period of gestation, when the mammary gland is already becoming active, a satisfactory amount of milk may be produced. Induration of lymph glands, and fibrous nodules in the mammary gland, disappear gradually as the organ assumes its full function. Unfortunately, Pérusset has not had an opportunity to make observations on regeneration of the mamma in sheep.

THE TREATMENT OF ULCERATIVE LYMPHANGITIS (*Traitemenit de la lymphangite ulcéreuse*). R. VAN SACEGHEM. *Bull. Soc. Path. Exot.* Vol. XI., No. 8. October 1918. Pp. 683-685.

Numerous forms of treatment for ulcerative lymphangitis have been suggested, and among them are the autopyotherapy of Belin and Velu, the leucocytotherapy of Bridré, and the vaccinotherapy of Truche. No worker, however, has as yet been able to find a specific treatment. Van Saceghem has obtained good results with pyotherapy. Horses have been cured or have greatly improved. The swelling of the limbs has diminished, and in a number of cases ulcers and specific abscesses have ceased to form. Belin and Velu regard their mode of treatment as a vaccinotherapy. But the pus of the abscesses in ulcerative lymphangitis often contain very few bacteria; very rarely are they sufficient in number to constitute a vaccin. Moreover, Bridré has been able to obtain absolutely identical results with his leucocytotherapy, which seems to show that the curative properties exist in the *débris* of leucocytes or in products derived therefrom. Van Saceghem has succeeded in producing the cure of horses affected with ulcerative lymphangitis by the injection of staphylococcus pus treated with ether. It appears to him that the curative effects of pyotherapy and leucocytotherapy depend upon the intense leucocytosis induced thereby. He has regularly found that after the injection of pus, from whatever source derived, a marked leucocytosis results.

Van Saceghem has sought for a method of pyotherapy which, while being practical, will give the best results. For the subcutaneous injection of pus treated with ether he substitutes the intravenous injection of pus emulsified with oil. The pus is derived either from a natural abscess of ulcerative lymphangitis or from an abscess produced by the subcutaneous injection of a culture of pus from specific lesions. To the pus so obtained he adds equal parts of oil and sulphuric ether, placing

the mixture in a flask and shaking vigorously so as to obtain a mixture sufficiently homogeneous to pass through fine muslin. The mixture is then placed in a flask with hermetically sealed mouth and shaken several times a day. After forty-eight hours it is ready for use. The supernatant fluid is carefully decanted, the pus is drawn into a syringe and injected directly into the jugular vein. The first injection is one of 3 c.c.; the subsequent injections are 5 to 7 c.c. or more. No local reaction is produced, and the temperature rarely rises more than 1°; nor does it remain elevated for longer than three days at most. Reinjection is performed when the temperature has fallen to normal. After each series of five injections an interval of several days is allowed to elapse before a new series is begun.

Pyotherapy and leucocytotherapy produce cures, but they are not vaccinations, inasmuch as they do not confer any protection against a fresh infection. Van Saceghem has inoculated horses, cured by pyotherapy, with the Preisz-Nocard bacillus, and these animals have reacted to the inoculation as though they had never been treated. It is the absence of all antibacterial property in the serum of infected animals that gives the disease its refractory character. While the serum is antitoxic, its bacteriolytic power is nil. This explains why Truche's treatment confers no more protection than does pyotherapy.

The author is conducting experiments in which he is endeavouring to vaccinate with living bacteria obtained from the lesions of horses affected with ulcerative lymphangitis, and he hopes to be able to obtain an immunisation against the disease.

MEDICINE.

RETENTION OF URINE AS A CAUSE OF COLIC IN YOUNG FOALS.

P. WILSON. *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 333-334.

In the experience of the author of this article it is fairly common to see cases of colic, due to the retention of urine, in foals from eight to twenty-four hours after birth. In these cases the bowels have acted regularly, the appetite has been normal, but no passage of urine has been noticed. The symptoms are mild at first but increase in severity. The animal assumes the position for micturition but no urine is passed. In cases of some standing, the abdomen looks fuller than normal, and in extreme cases palpation reveals the presence of fluid. The author

has seen only one case in a filly foal—the condition being most frequent in colt foals.

In the author's view, the condition may be due to one of two causes:—“(1) A weakness of the bladder wall, which makes it incapable of expelling the contents. (2) A gluing together of the walls of the urethra with mucus, which the contraction of the bladder is unable to overcome.”

The quickest way to give relief is by catheterisation.

ASTHMA AND ALLIED CONDITIONS IN THE HORSE AND OX. F. T. HARVEY. *Vet. News.* Vol. XV., No. 766. 7th September 1918. Pp. 314-316.

In an article reporting cases of asthma in the domestic animals, the author deals in general terms with spasmodic asthma in the ox, associated with angiyo-neurotic oedema. If, he says, bronchial asthma as a distinct affection is rare in cattle, the occurrence in them of an asthmatic condition in association with manifestations of an urticarial nature is by no means uncommon. Such a disease is well known among stockowners in Cornwall, where it is known as “head fla” or “bladder under the tongue,” and in Devon, where it is sometimes called “ting” or “tingle.” The disease seems to be peculiar to cattle, and involves the mucous membranes and skin, sometimes one and sometimes the other. Expulsion of the foetus generally occurs in pregnant animals, from involvement of the uterine mucosa. When the respiratory mucous membrane is affected the symptoms may be very severe, and death from oedema of the larynx may occur. In those cases in which asthmatic symptoms predominate, the presence of swelling of the eyelids and vulva or anus, and the absence of fever, render diagnosis easy. Diarrhoea, which develops suddenly and as suddenly disappears, is often one of the first symptoms. Symptoms may be transient or may continue for hours, and in not a few cases there are remissions and exacerbations. Swelling of the dewlap is fairly constant, and some areas of the skin are raised and hard.

The name “bladder under the tongue” is given locally to the disease because of the frequent swelling of the tissues about the frenulum of the tongue; and “ting” or “tingle” indicates the presence of cutaneous irritation. The hair over certain parts of the body may be quite wet, and small droplets of sweat may be seen on the points of the hairs. Lachrymation is copious. The onset of the attack may be sudden.

The administration of a saline purgative is the best treatment.

PURPURA HÆMORRHAGICA AT AN ARMY REMOUNT. C. W. STRODE.
Amer. Journ. Vet. Med. Vol. XIII., No. 9. September 1918.
Pp. 446-448.

A mode of treatment is described, and is said to have given satisfactory results at one of the auxiliary remount depôts. All swellings with tenseness of the skin are bathed with a solution containing:—Alum, 8 grammes; lead acetate, 4 grammes; gum camphor, 12 grammes; alcohol, q.s. to dissolve; water, enough to make up to 1000 c.c. (about 960 c.c. of water is required). A routine part of the treatment consists of the hypodermic injection of half a grain of strychnin sulphate at six- to twelve-hour intervals.

The following tonic is administered in 30-c.c. doses at twelve-hour intervals:—Fluid extract of gentian, 60 c.c.; fluid extract of nux vomica, 30 c.c.; water, 390 c.c. If superpurgation occurs, 30 grammes of alum are given at eight-hour intervals until the condition of the faeces becomes normal.

Careful disinfection of the skin is essential. Sand bedding is used, kept as smooth as possible, and disinfected at one- or two-day intervals. If sloughing of the skin takes place, a frequent spray of a 1 per cent. solution of potassium permanganate has been found to give very satisfactory results. Mangers and water buckets are disinfected daily.

RICKETS IN FOXHOUND PUPPIES: A CLINICAL AND EXPERIMENTAL INVESTIGATION. L. B. BULL. *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 3. September 1918. Pp. 193-214.

An investigation was carried out among puppies belonging to the kennels of the Adelaide Hunt Club, as an attempt to discover the essential cause of rachitis as it affected these animals. During the three years preceding the beginning of the investigation the kennels had paid toll to the tune of 100 per cent. of young puppies as the consequence of the ravages of the disease. Several and fairly exhaustive experiments were carried out upon both healthy and already affected animals.

It would appear that rachitis, as encountered, was an affection of the young foxhound puppies under three months old, due neither to irrational dieting nor bad hygienic conditions alone, but to a combination of the two, which, in some way, weakened the resistant power of the animal against a hypothetical infection or intoxication. A gastrointestinal catarrh was apparently the primary lesion induced by the combined effect of the two conditions. Symptoms of a general intoxication next became evident, involving especially the bones, bone-marrow, thymus, lymph glands, and sometimes the spleen; these organs, in

order, being apparently the most vulnerable parts of the young, rapidly growing animal.

The various theories which have been advanced to explain the etiology of rachitis are discussed, stress being laid throughout the article on the importance of the state of the alimentary tract, a catarrhal condition of which was discovered post-mortem in all cases of the disease. The etiological relation of deficiency of calcium, bad hygiene, faulty diet, disturbance in the function of the glands of internal secretion, lack of exercise, organisms, and infection and intoxication are all fully considered.

To Marfan's explanation of the intoxication theory as it applies to the osteopoietic and haematopoietic functions, countenance is given in preference to the various other theories cited.

The results of the investigation seem to furnish evidence that rickets is the reaction of the animal body to an infection or chronic intoxication associated with bad feeding, which of itself however cannot be regarded as the cause of the condition.

(W. C. M.)

ABNORMAL RATIO OF CHLORIDE OF SODIUM IN THE SERUM OF THE HORSE IN DISEASE (*Recherches sur les taux anormaux de chlorure de sodium dans le sérum du cheval malade*). AUGUSTIN.
Rev. Gén. Méd. Vét. Vol. XXVII, No. 321. September 1918.
Pp. 425-433.

In an earlier article (*Her. Gén. Méd. Vét.*, 1914) Augustin has given the results of his observations on the quantity of sodium chloride in the serum of the healthy horse. He has shown that, in a state of health and under ordinary conditions, the blood serum of the horse contains about 6·75 grammes of sodium chloride per litre, which is slightly higher than the figure (6·54) generally given by authors. Normally this ratio is a biological constant, which only varies within practically negligible limits.

In the present paper he produces evidence that the chloride ratio varies notably in various infectious pyrexias. In the case of horses affected with pasteurellosis (pneumonia) the chloride ratio was markedly diminished. In one, a case of serious pneumonic infection, the sodium chloride in the serum fell to 5·87 (that is, 0·88 per 1000 below the normal) when the disease had reached its height. In another case the amount of chloride was 0·90 per 1000 below the normal on the third day of the disease. Without making a dogmatic statement, it is possible to say that often the ascending temperature curve coexists with a descending chloride curve. And it appears that the diminution of chloride persists into convalescence; so that it may be said that health

is not restored when the temperature has fallen to normal, but rather when the saline concentration in the serum has returned to the normal.

The question of whether the diminution of chloride is the cause or the effect of infection is difficult to answer, because *Le médicin ne voit jamais de maladies qui commencent, mais toujours des maladies qui finissent* (Héricourt). It may be doubted that the decrease of chloride is primary, because the lowest point in the saline ratio has not been observed at the moment when clinical manifestations first made themselves evident, but about the time of the greatest pyrexia. The question, however, requires further observations before it can be answered definitely.

It follows from this investigation that the daily administration of sodium chloride is an essential adjuvant to the ordinary means of treatment of infections. The dose given by the author is 200 grammes *per diem*. This is well supported, and acts as a condiment that renders acceptable food which would otherwise be refused.

HOGS AND THE TENT CATERPILLAR. F. M. HAYES. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 59-61.
4 Figures.

The writer of this note was called to investigate a disease of pigs which was suspected to be swine fever, but which presented features of unusual interest. On two ranches in a small valley in California thirty pigs had died within two weeks, while the remainder of the two herds of forty-seven and thirty-four, respectively, were showing symptoms of disorder. The most conspicuous symptom was the defecation of long strings of faeces, accompanied by severe straining, and resulting, in many cases, in leaving a trail of several inches of faeces attached to the anus of the pig. All the pigs were gaunt, but most of them were feeding (on soaked barley). Fever was not a constant symptom.

A pig showing signs of abdominal distress and evidently moribund was chosen for post-mortem examination. A well-defined volvulus of the small intestine was discovered, the walls and lumen of the gut containing a quantity of extravasated blood. There was an excess of fluid in the peritoneal cavity, but no other lesions of importance. On opening the digestive tube from the stomach to the anus, an undigested mass was removed in one continuous string intact, composed of fine, wool-like fibres enmeshing bits of grass, barley hulls, and small fragments of a dark brown material.

On making an examination of the feeding ground, hundreds of the cocoons of the tent caterpillar (*Malacosoma disstria*) was discovered, and the owner of the pigs stated that the caterpillars had not been so-

numerous in his ten years of residence. "To complete the evidence against the tent caterpillar cocoon, a number were collected. A few were thrown in front of a healthy looking shoat. They were consumed with avidity. The experiment was repeated on others, with the same result. A closer inspection of the stomach contents of the hog upon which the autopsy was held proved the dark brown fragments mentioned above to be masticated pupæ. We now felt justified in concluding that the cocoon of the tent caterpillar was the causative factor in this trouble."

METHODS.

AN IMPROVED METHOD FOR RECOVERING TRYPANOSOMES FROM THE BLOOD OF RATS FOR ANTIGEN PURPOSES IN CONNECTION WITH COMPLEMENT FIXATION. F. H. REYNOLDS and H. W. SCHOENING. *Journ. Agric. Res.* Vol. XIV., No. 13. 23rd September 1918. Pp. 573-576.

A method has been described by Watson ("Dourine and the Complement-fixation Test," *Parasitology*, 1915, viii. 156-183) whereby the trypanosomes may be recovered in large quantities from the blood of infected rats killed at the height of the disease. It is essentially a method of repeated centrifugalising, and has the disadvantage that many of the organisms will be drawn down by the erythrocytes during the process.

Reynolds and Schoening now describe a method for which the following advantages are claimed:—The antigen is freed of all erythrocytes; all the trypanosomes present in the blood are recovered; the keeping quality is improved; the time consumed is about one and one-half hours, with practically no effort, as compared with four or five hours; the antigenic power is increased and the anticomplementary action diminished.

By the new method, "blood of infected rats is collected in a 1 per cent. sodium-citrate solution in physiological salt solution in order to prevent coagulation. When all the blood has been collected, the solution is filtered through cheese-cloth to remove clots, fibrin, etc., poured into tubes, and centrifugalised for about twenty minutes at 2100 revolutions per minute. This precipitates all the corpuscles and most of the trypanosomes, leaving an upper stratum of blood-serum and citrate solution containing some of the organisms. This fluid is drawn off and again centrifugalised in order to recover any of the protozoa which may be present. To the other tubes containing the mass of corpuscles mixed with and superimposed by trypanosomes is added sufficient distilled

water to produce complete haemolysis of the rat erythrocytes, a matter of about twenty minutes, which procedure is facilitated by agitation of the mixture in a flask. This also is centrifugalised, but in this instance for about half an hour, upon the completion of which there is found at the bottom of the tubes a mass of trypanosomes with an admixture of stroma of the haemolysed red cells, which latter, in quantity, has been found to be negligible. After discarding the supernatant fluid (haemoglobin-stained water) physiological salt solution is added and the material vigorously shaken until the mass of trypanosomes is disintegrated and evenly distributed throughout the solution. Centrifuging is again resorted to with similar results, the washed mass of trypanosomes being packed at the bottom of the tubes. The salt solution is poured off and an amount of preserving fluid (physiological salt solution and glycerin $\ddot{\text{a}}$) equal to about twice the amount of trypanosomes added; the mixture is then agitated until a uniform suspension is acquired, when it is stored at a low temperature until used."

OBSTETRICS.

MANIPULATION OF THE OVARY (Die manuelle Behandlung der Ovarien).

F. BÜRKI. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 10.
October 1918. Pp. 477-483.

Although Bürgi does not see in manipulation of the ovary (rupture of cysts, expression of corpus luteum) a panacea for sterility of cattle, it very often leads to the desired result without any other form of treatment. Manipulation of the ovary is often a two-edged sword; untoward results occur, but these are generally referable to conditions which may be classed as anatomical (shortness of the mesometrium, large size of the corpus luteum, cysts with thick walls or dense contents, narrowness of the vagina), physiological (hyperæmia of cestrum), physical (fatigue of the operator's arm, pressure on the intestine, restlessness or sudden start of the animal operated on), and pathological (ovarian tuberculosis, abscesses, haemophilia).

In the technique of ovarian manipulation the following procedure is recommended:—

1. The quiet and thorough examination of the animal, with particular regard to the above-mentioned possible causes of failure and accident. In all cases where it is possible a bimanual examination (per rectum and per vaginam) should be made. In the case of the beginner, and also with the practised operator, it is necessary to determine, not only

if the ovary can be palpated and compressed, but if it can be fixed and compressed for a sufficient length of time. The hyperæmia of oestrus, large accumulations in the uterus due to pyometra or myxometra, pregnancy, tuberculosis of the ovary, tube, or uterus, abscess, adhesions, short mesometrium, all rule out manipulation of the ovary. Severe pyometra disposes to dense and resistant corpus luteum, with possibility of post-operation haemorrhage, while ovarian manipulation is almost always successful in mild or moderate cases of pyometra.

2. Correct pressure and, what is more important, good after-compression. The right ovary is compressed with the right hand and the left with the left hand. The bimanual method (per rectum and per vaginam) not only facilitates orientation but also permits of a correct and good grip of the ovary and its ligaments. The operator, however, should learn to operate with both hands. After-compression is exercised on the mesovarium by the index finger and the thumb. This is done per rectum or per vaginam, according to circumstances, and a slight twisting and stretching of the vessels is important as preventing haemorrhage. The duration of the after-compression depends upon the difficulty of the operation. In cases of thin-walled cysts or easily expressed corpora lutea one to three minutes suffices, while, after resistant cysts or corpora lutea which have been expressed with difficulty, five to ten minutes are necessary.

PARASITOLOGY.

ETIOLOGY AND TREATMENT OF GRANULAR DERMATITIS (Cause étiologique et traitement de la dermite granuleuse). R. VAN SACEGHEM.
Bull. Soc. Path. Exot. Vol. XI, No. 7. July 1918. Pp. 575-578.

Previous observations have established the fact that flies are the carriers of the larvae of *Habronema* which cause "summer sores" of the horse (*Bull. Soc. Path. Exot.*, 1917, x. 726). Subsequent experiments have absolutely confirmed this fact, and have proved that the parasite found in the nodules of "summer sores" is an erratic larva of *Habronema muscae*. Larvae of *Musca domestica*, raised in the laboratory beyond all possibility of infection, were placed in horse dung known to contain *Habronema muscae*. The flies to which these larvae gave origin were found to be infected with larvae of *Habronema muscae* in the proportion of 70 per cent. The larvae were numerous in the proboscis as well as in the body of the insects. Infection of the

fly with the larvæ of *Habronema* can only take place during the larval stage of the fly.

The larvæ of *Habronema* placed on the dry skin evince no power of piercing the skin and die rapidly: direct infection by dung is therefore very problematic. If, on the contrary, they are placed on solutions of continuity covered with serum, they show a well-marked tendency to lodge in small irregularities.

Prophylactic treatment must be directed towards the destruction of *Habronema muscae* which live in the stomach of the horse. The administration of arsenic has yielded good results. Litter must be removed, and fresh dung should be buried in order that the heat of fermentation may destroy the larvæ. Wounds should be protected from flies, for preference by dusting with a desiccating powder. The best curative treatment consists in carefully disinfecting the wounds and then applying a powder consisting of whiting 100, alum 20, naphthalin 10, and quinin or any other bitter powder 10.

HABRONEMIC CONJUNCTIVITIS. J. C. LEWIS and H. R. SEDDON. *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 2. June 1918. Pp. 87-94. 2 Figures.

Apparently the occurrence of *Habronema* in the skin and subcutaneous tissues has become more common of recent years, or, at any rate, it has been more frequently noticed. The present paper deals with four cases in which the conjunctiva of horses was the seat of lesions. In three of the cases small necrotic areas could be detected; while in the remaining case, though no necrotic areas were visible, there were many small, whitish scars, which are considered by the authors to be the result of absorption of necrotic foci. This view is supported by the occurrence of scars, along with small caseous areas, in one of the horses. In this animal there was also a tumour on the shoulder "at the site of a collar gall, about the size of a hen's egg, easily defined, projecting, firm to the touch, not acutely inflammatory, and not tender." In one of the cases parasites were found in the necrotic foci. These, the authors think, most probably belong to the genus *Habronema*.

Possibly the disease is much more common than is generally supposed, probably because the habronemic infection of the conjunctiva, in the majority of cases, gives rise to few or no symptoms, and the small necrotic areas become absorbed after the death of the parasite. In milder cases, with persistent slight lachrymation, the small granular masses caused by the parasites are easily overlooked in a casual examination of the eye.

Whether the parasite detected is *Habronema muscae*, *H. microstoma*, or *H. megastoma* remains to be determined by future observation.

EQUINE TRYPANOSOMIASIS IN MOROCCO.

1. "Une trypanosomiase du cheval au Maroc. Étude clinique et expérimentale." H. VELU. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 322. October 1918. Pp. 489-513.
2. "Les troubles oculaires et locomoteurs dans la trypanosomiase des chevaux du Maroc." H. VELU. *Bull. Soc. Path. Exot.* Vol. XI., No. 7. July 1918. Pp. 566-568.
3. "La trypanosomiase des chevaux du Maroc. Essais du traitement." H. VELU. *Ibid.* Vol. XI., No. 6. June 1918. Pp. 448-451.

1. Equine trypanosomiasis in Morocco is a very serious disease, but fortunately confined to certain zones of no very great extent. Velu regards it as being a specific disease because it has special clinical features, differs experimentally from other trypanosomiases, and is caused by a dimorphic organism. The period of incubation of the natural disease is difficult to determine because the available information is uncertain. In one of the animals which were under observation the incubation could not have been less than forty-four nor more than 104 days.

The primary symptoms are very vague and often pass unperceived. The animal becomes dull, somnolent, and indifferent to external stimuli. The appetite is preserved but is capricious. The horse becomes sluggish, and is easily made to sweat, gets out of breath, and is quickly fatigued. Febrile periods are more or less frequent and of more or less regular recurrence. On an average, the afebrile intervals range from twenty to thirty days. A febrile period generally lasts for four or five days, but may extend to six, seven, or even eight days. In some cases the temperature falls after only a few hours.

Succeeding general dulness and stupefaction, locomotor derangements become manifest in the form of muscular weakness and atony, unsteadiness of gait, inco-ordination, paraplegia, paresis, and incontinence of urine. Ocular disorders are fairly constant, but probably of less importance than the stupefaction and locomotor derangements. The conjunctiva is generally yellow and sometimes distinctly jaundiced, and there are petechiae and erosions. The eyelids are swollen and the eye is partly closed. In very severe cases of rapid development the ocular disorders are more intense, the petechiae become confluent, the eye completely closed, and the animal appears to weep tears of blood. Sometimes there is keratitis, but this is rather rare.

The characteristic oedema of trypanosomiasis is often absent, and when present it is localised and not persistent. There is a well-marked venous pulse, and when oedema and ocular symptoms are present

there is generally also effusion into the pericardium. Typical cases present the features of a progressive and chronic anaemia, ending in death.

The duration of the disease is difficult to determine, but in one case it has been known to last for a year.

In the horse, dog, and rabbit the organisms may be either long, with free flagella, or shorter, thicker, and with short flagella or none. The trypanosome possesses great virulence for the rat, but relatively little for the rabbit, in which the disease is chronic, slow, and irregular. Experimental infection of the dog led to a subacute disease with frequent febrile periods. In two experimental mules the period of incubation was nine and five days respectively, that is, development was rapid as compared with natural infection in the horse.

Many chemical substances have been tried in treatment, but with apparently absolutely no effect on the course of the disease. Massive doses of atoxyl, thiarsol, and tartar emetic exercise an unfavourable effect, hasten death in animals in poor condition, and do not cure others. Massive doses of garyl and novarsenobenzol possibly act similarly. Arsenical preparations are apparently most useful, in small repeated doses, when employed to sustain the natural forces of the sick animal, and thus permit it to combat the causal parasite.

2. and 3. The subject-matter of the second and third papers is contained in 1.

BOVINE PIROPLASMOSIS IN ITALY AND SWITZERLAND.

1. "L'emoglobinuria dei bovini regioni prealpine è una piroplasmosi."

L. COMINOTTI and G. DI DOMIZIO. *La Clinica Vct.* Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 425-430.

2. "La piroplasmiasis des bovidés en Suisse." B. GALLI-VALERIO and H. STALDER. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 10. October 1918. Pp. 471-477. 1 Figure.

1. The authors record the occurrence in the pre-Alpine region of Lombardy and Verona of a disease with acute course, known as "pisciasangue" ("red-water"), which attacks cattle (more rarely sheep) in spring and summer. The temperature rises to 40° or 41° C. or even 42°, there is more or less marked jaundice of the connective tissues of the whole body, gelatinous infiltration of connective tissue of certain parts of the body, especially around the kidneys, pronounced hydrarnia, enlargement of the spleen, lesions of the fourth stomach, varying from simple hyperæmia to gelatinous or haemorrhagic infiltration, catarrhal enteritis, and finally extensive haemorrhages under the endocardium and

in the mucosa of the bladder. Examination of blood-smears revealed the presence of piroplasma either free or in the red cells; isolated and "ring" forms predominated. The parasites were usually numerous in the blood in the spleen but very scarce and sometimes absent in the peripheral blood. The authors consider that the organism is nearer *P. bovis* than *P. bigeminum*, but further work is required to determine the species. From the infected cattle numerous ticks were collected which present the characters of *Boophilus annulatus*.

(J. H. A.)

2. Since 1912, Stalder has observed several cases of severe acute anaemia, accompanied by marked haemoglobinuria, in cattle in the canton of Vaud in Switzerland. The previous history of these cases has been one of diminution in the yield of milk, followed by the emission of blackish urine. As these symptoms increased, the digestive functions became impaired and the animal forces gradually diminished. On first seeing the affected animal, one was struck with the pallidity of the muffle and the mucous membranes in general. The animal was weak and moved with difficulty, the gait behind was staggering, and in contrast with the sprightly appearance of the head. Respiration was normal, but the circulation was disturbed. A venous pulse was very evident, and there was extreme tachycardia (120 to 150 pulsations during repose, and 160 to 180 on exertion). The urine was brown at the outset of the disease and then became black. Viewed in a flask by transmitted light, it was clear but of the colour of Bordeaux wine, without deposit; when shaken, a persistent froth was produced. The quantity excreted was normal. Examined microscopically, neither blood corpuscles nor casts were discovered. A small quantity of albumin could be detected, and a positive reaction was obtained with Gmelin's reagent. In the case last observed there was slight diarrhoea. The temperature was 38·5° to 38·8° C., but in this connection it is necessary to recall the observations of Krogius and v. Hellens (*Arch. Méd. Exper.*, 1894, vi. 353) to the effect that the elevation of temperature in this disease is very slight, and may even escape detection. In addition, the elevation of temperature has been noted as occurring exclusively at the commencement of the disease: later the temperature may even be subnormal (Celli and Santori, *Ann. d'Igiene Sper.*, 1897, vii. 249). The disease proceeded rapidly, and ended fatally at the end of three or four days.

Post-mortem examination revealed dropsy of the serous cavities, fatty degeneration of the liver with slight icterus, an enlargement of the spleen, with a black and diffused condition of the pulp, and a very friable cortical substance and fatty degeneration of the medullary substance of the kidney. The jaundice was not constant, since some-

times the fat presented a waxy whiteness. In such cases the intestine presented a hyperæmia and the gall bladder was full of bile. The blood-normal in quantity, was sienna-coloured, and of slow and indifferent coagulability.

Trypan blue not being available, the effect of methylene blue was tried. Five grammes per os cleared up the urine, but the subcutaneous injection of 100 c.c. of a 1 per cent. solution produced no effect.

The post-mortem manifestations pointed to piroplasmosis, the existence of which in Switzerland has long been suspected by Galli-Valerio. This disease indeed has been observed over almost the whole of Europe, from the basin of the Mediterranean to Finland and Norway; but up to the present Switzerland appeared to have escaped. The last of the five cases described above, however, gave Galli-Valerio the opportunity to examine smears of blood, spleen, liver, and kidneys. Blood-smears were taken from the living animal, fixed in alcohol and ether, and stained with Giemsa stain. Some corpuscles were larger than normal and contained basophile granules; but corpuscles containing piroplasma were somewhat rare. The predominating form of the organism was pear-shaped, and single rather than in pairs. The organism was feebly stained at the periphery, and contained clear spaces, particularly in its wider part. One or several eosinophile granules were often noted in the narrow part of the organism or about its periphery. The dimensions of the piroplasma ranged from 3 to 4 μ by 1 to 1.5 μ : the larger forms, generally single, were the more common. In some erythrocytes there were ovoid or almost spherical forms with fragmented chromatin. Only here and there, beside destroyed erythrocytes, were free piriform organisms to be found.

Unfortunately the spleen, liver, and kidneys were received in a state of decomposition, and the organisms were not numerous. Their paucity may have been due to attempts at treatment. Extremely rare in the liver and kidney, they were more numerous in the spleen.

If there are really two species—*Piroplasma bigeminum* and *P. divergens*—Galli-Valerio thinks that it is highly probable that the species he found in the foregoing case was *P. divergens*, and he thinks that it is very probable that *Ixodes ricinus* is the transmitter.

TRYPANOSOMIASIS OF THE DROMEDARY IN ERITREA.

1. "Una tripanosomiasi del dromedario eritreo (*Gudhè*). Cenni sulle mosche ematofage dell Colonia Eritrea." G. DI DOMIZIO, *La Clinica Vet.* Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 391-413. 1 Plate (11 Figures), 3 Text-Figures.

2. "Circa il tripanosoma del camello della Colonia Eritrea." A. PRICOLO and G. FERRARO. *Ibid.* Nos. 20-21. 31st October 15th November 1918. Pp. 522-524.

1. Among the dromedaries in Eritrea there is a trypanosomiasis, known as *gudhò* by the natives, which is transmitted usually by tabanids and perhaps also by Stomoxys and Lyperosia. The trypanosome of *gudhò* differs morphologically and biologically from that of *giahān* (the trypanosomiasis of bovines in Eritrea); it may be the same as the trypanosome of *atteh* (another trypanosomiasis of dromedaries in Eritrea). The morphology of the trypanosome, the clinical manifestations, the mode of transmission (by tabanids), and the geographical distribution suggest that the trypanosome of *gudhò* may be the same as that of camels in the Mediterranean region of Africa. The trypanosome of *atteh*, like that of *mbori* (the best known of the trypanosomiases of the dromedary), seems to be a variety of *Trypanosoma evansi*. Further investigations are required to clear up these points.

(J. H. A.)

2. Pricolo and Ferraro state that Di Domizio's article, noted above, confirms conclusions arrived at by them in 1912. They affirm that the trypanosome which they have found in the camel in Eritrea is *T. evansi*, identical with that found in Egypt, Algeria, Morocco, Soudan, and Somaliland.

TWO NEMATODES OF JAVA (Deux nématodes de Java). A. J. SALM.
Bull. Soc. Path. Exot. Vol. XI., No. 8. October 1918. Pp. 705-710. 2 Figures.

In the abomasum of an ox killed in the abattoir at Magelang, Java, Salm found eleven small brown worms, which were easily detected by their rapid serpentine movements. The movements persisted for two hours after the parasites were placed in physiological saline. Five of the worms were males and six females. A detailed description of them is given. The parasites belonged to the genus *Mecistocirrus*, and presented certain of the features of *M. fordii* along with others resembling *M. digitatus*. They resembled the latter the more closely in respect of the length of the spicules and the dimensions of the copulatory bursa. *M. digitatus* (von Linstow, 1906) possesses cervical papilla, which were not present in Salm's specimens. In his specimens the male was the smaller, but the copulatory bursa had an accessory lobe, the eggs were not segmented, the tail measured only 50 μ , and the vulva was 237 μ from the caudal extremity of the worm. In *M. digitatus* the tail is from 130 μ to 170 μ in length, and the vulva is 475 μ to 500 μ .

from the caudal extremity. These differences appear to the author to be of sufficient moment to permit him to make a new species, for which he proposes the name *Mecistocirrus digitatus*, var. *javanica*.

In the lung of a pig, also at the abattoirs at Magelang, Salm found a great number of small worms, which he considers to be *Metastrongylus elongatus* (Dujardin, 1845). Certain parts of the surface of the lung were of a pale rose colour and indurated. On incision of these areas, very thin, filiform, and very supple worms were extruded in a mass. The masses were so compact and the worms so fragile that it was difficult to obtain intact specimens. Both males and females were present, females being the more numerous.

CONTRIBUTION TO THE STUDY OF *GASTRODISCUS AEGYPTIACUS* (Contribution à l'étude du *Gastrodiscus aegyptiacus* (Cobbold, 1876)).

R. VAN SACENIEM. *Bull. Soc. Path. Exot.* Vol. XI., No. 5. May 1918. Pp. 396-397.

The study has been conducted in the Bacteriological Laboratory at Zambi (Lower Belgian Congo). The eggs were easily found in fresh faecal matter, and were 150 μ to 170 μ long by 90 μ to 95 μ broad. At laboratory temperature (average 28° C.) the contents of the egg becomes very granular after three weeks. Moisture is not necessary for segmentation, which can take place equally well in dry surroundings. A few days later a small vermicule, with intermittent movements, becomes distinguishable inside the egg, and vibratory movement of the cilia can be readily determined. The anterior end of the ciliated larva faces the micropyle of the egg, the closure of which is forced, and the larva escapes. Moisture is now necessary, otherwise the miracidium quickly dies. The morphology of the *Gastrodiscus* miracidium is not different from that of other miracidia. The ciliated larva is 164 μ long by as much as 73.8 μ broad.

The large number of horses infested with the parasite, its rapid distribution through the country, and the great number of parasites that may be found in the intestines, lead to the conclusion that the miracidium gains easy access to large numbers of the intermediate host, which is probably a mollusc found in abundance in marshy land.

As a rule, infection with *Gastrodiscus aegyptiacus* gives rise to no serious symptom; but in debilitated conditions the parasite may cause severe complications and a progressive anaemia, ending in death of the host. Horses heavily infested show signs of colic, which disappear on the administration of laudanum and ether. There is no specific treatment. Horses should not be allowed to drink water from marshes, or graze on land in their neighbourhood; and fodder cut close to marshes should not be used for animals in the stable.

PATHOLOGY AND BACTERIOLOGY.

BACTERIA IN COWS' MILK.

1. "Bacterium abortus and Related Bacteria in Cow's Milk." ALICE C. EVANS. *Journ. Inf. Dis.* Vol. XXIII., No. 4. October 1918. Pp. 354-372. 5 Tables.
2. "A Streptothrix (*Nocardia*) Infection of Cows' Udders." *Ibid.* Pp. 377-379. 1 Table.
3. "Über das Vorkommen des *Bacterium abortus* *infectiosum* Bang in der Milch gesunder Kühe." W. STECK. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 11. November 1918. Pp. 547-551.

1. In an earlier paper (*Journ. Inf. Dis.*, 1916, xviii. 437) it has been shown that, besides typical strains of *B. abortus*, other bacteria of similar morphology were eliminated from the udders of many cows whose milk was examined. In the previous investigation the history of the cows was unknown. Now many samples of milk have been examined from cows of which the history was known, in order to determine whether there is any correlation between the presence of organisms similar to *B. abortus* in the milk and the occurrence of abortion. That the serum of a certain small proportion of aborting cows does not react on the typical strains of *B. abortus* suggested the possibility that some of these bacteria may sometimes be the cause of abortion. The main results of the investigation are summarised:—" *B. lipolyticus* and other abortus-like bacteria were isolated from the milk of ten of twenty-four, or 41·7 per cent., of cows which had not aborted. The cows belonged to a herd in which there was an occasional abortion, but no general outbreak. The same kinds of bacteria were isolated from the milk of 100 per cent. of twelve cows which had aborted as a result of natural infection. *B. lipolyticus* was cultivated from the milk of 66·6 per cent. of these cows, and other abortus-like bacteria were cultivated from the milk of 50 per cent. of them.

" Typical virulent strains of *B. abortus* could not be isolated from the milk of either of the groups mentioned above.

" Typical *B. abortus* was found to be present in very large numbers in the milk of two cows that had been repeatedly inoculated with a mixture of strains of that organism. It was found only once, in rather small numbers (450 per c.c.), in the milk of a cow which had aborted after being inoculated once with the same mixture of strains of *B. abortus*. It was not found in the milk of another cow which aborted after receiving one inoculation.

" The data indicate that virulent strains of *B. abortus* are not eliminated continuously in large numbers in the milk of cows which have

aborted, even though the blood-serum continues to react positively to the agglutination test."

Reasons are adduced for assuming that there is the possibility that some of the strains of abortus-like bacteria may cause abortion in those cases in which the blood-serum reacts negatively to *B. abortus* antigen.

Because of the marked differences in the biochemical reactions and cultural characteristics between *B. lipolyticus* and *B. abortus*, "it is a fact worthy of attention that Bang's original description of the organism causing contagious abortion agrees with our cultures of *B. lipolyticus* and does not agree with our cultures of *B. abortus*. Bang noted that the growth of his organism was confined to a zone a few millimetres beneath the surface of the agar, that growth in broth culture was in the form of a fine granular sediment, and that growth was greatly favoured by the addition of serum to the agar. It would seem by comparing our strains of virulent *B. abortus* with Bang's original description of his organism that there must be more than one variety of bacterium capable of causing abortion in cattle." In this connection the bacteriological findings in the case of a cow that had aborted are suggestive.

"The bacterial flora of the udders of a herd in which there existed an outbreak of abortions was found to be abnormal in the large number of udders which were infected with streptococci, and it was also abnormal in showing a general infection with a streptothrix. The abortus-like bacteria were found in 66·6 per cent. of the samples of milk. The abortus-like bacteria included seven acid-producing strains which had never before been found."

2. In the course of the investigation noted in the preceding paragraph a general infection of the udders with a streptothrix (*Nocardia*) made its appearance. The organism was isolated from eighteen of twenty-one samples (85·7 per cent.) of milk. Plate cultivation indicated that the number of organisms in the samples of milk when fresh drawn varied from 140 to 2600 per c.c. Apparently the literature contains only two references to the occurrence of streptothrix in milk. One of these is the writer's paper on "Bacteria of Milk Freshly Drawn from Normal Udders" (*Journ. Inf. Dis.*, 1916, xviii. 437); the other is by Thöni (*Gesundheitsamt*, 1914, v. 9), who reported that he had found streptothrices in the market milk of Bern, Switzerland. It is possible that the organisms reported by Thöni may have got into the milk after it was drawn; and presumably streptothrix infection of the udder is unusual, otherwise it would have been noted by investigators who have studied the bacterial flora of aseptically drawn milk.

Evans gives the characters of the streptothrix isolated by her, and concludes that it agreed in morphology, cultural characteristics, bio-

chemical reactions, and staining properties with *Streptothrix hominis III.*, which was first described by Foulerton (*Lancet*, 1910, clxxviii. 626). "The milk streptothrix therefore agreed with the species nearest related to the true fungi with long, branched mycelial threads, and common formation of conidia. It was one of the least acid-fast organisms of Claypole's group (*Journ. Exp. Med.*, 1913, xvii. 99), and serologically was the most remotely related to *B. tuberculosis*."

3. Steck has examined the milk, collected aseptically, from fourteen apparently healthy cows. After $\frac{1}{2}$ to 1 litre of milk had been drawn from all four quarters of the udder, a sample was taken separately from each quarter, and culture media were inoculated. Samples were taken from each cow on two separate occasions, both being at the ordinary time of milking. Samples from seven of the cows yielded growths of Bang's bacillus of contagious abortion. In two of the cows the milk from only one quarter yielded the organism; while in three animals the bacillus was grown from all four quarters. The other two cows gave the organism in the milk of two and three quarters respectively.

Concerning the past history of five of the cows there was nothing which would prepare one for the discovery of the organism of contagious abortion in the milk. They had had five, three, four, six, and one normal pregnancies. Two only of the cows had exhibited any irregularity in pregnancy. In 1914 one of them gave birth to a dead calf on the two hundred and forty-second day, but had had three normal pregnancies since that time. In 1917 the other cow gave birth to dead twins on the two hundred and eighty-second day of pregnancy, but in 1918 carried a healthy calf for two hundred and ninety days.

A PLEOMORPHIC BACILLUS FROM PNEUMONIC LUNGS OF CALVES
SIMULATING ACTINOMYCES. T. SMITH. *Journ. Exp. Med.* Vol.
XXVIII., No. 3. September 1918. Pp. 333-344. 4 Plates
(10 Figures).

The writer has encountered a mild epidemic of pneumonia in calves over four weeks old. One at least, but usually all, the lesser lobes (apical, cardiac, and intermediate) were pneumonic: more rarely the diaphragmatic lobe was also partly affected. With few exceptions, the distribution of the lesions was symmetrical. "The trachea and bronchi usually contained soft, opaque, whitish masses embedded in mucus. When one of the affected lobes was cut across, a pearly white, thick, mucoid mass slowly oozed out of the cut ends of the small bronchioles within the diseased region. The affected lobes were slightly or considerably larger than in the normal collapsed state. The tissue was bright reddish and permeated with greyish 1 to 2 mm. foci, closely set.

The texture of these did not differ appreciably from the rest of the tissue. Sections of the diseased lobes indicated a suppurative broncho-pneumonia, with some fibrin in the most recently invaded tissue." This description applies to the acute stage. In some of the older cases circumscribed portions of the lung had become encapsulated abscesses.

In connection with the broncho-pneumonia, a bacillus was found in pure culture. "It occurs in the exudate as a minute bacillus in small groups. In cultures it appears in three forms: as a bacillus, as a coccus-like endospore or arthrospore, and as a conglomerate *Actinomyces*-like flake or colony with peripheral clubs. The bacillary and coccoid forms occur on agar, the *Actinomyces* form in the condensation water of coagulated serum (horse). The coccoid form is probably a spore state, the minute refringent spore being contained in a roundish, unstainable mass representing either the remnants of bacillary substance or some capsular material. The somewhat striking similarities between this organism and *Actinomyces* are expressed by the massed growth with terminal clubs, the bacillary and coccoid stages, all of which are characteristic of *Actinomyces*."

After a consideration of the relationship of the pleiomorphic bacillus to bacteria already described, the writer is, on the whole, inclined to regard the bacillus of Lignières and Spitz ("Actinobacillose," *Rev. Soc. Med. Argent.*, 1902, x. 105) as identical with his own, with such variations as are probable within any species or strain widely separated geographically and attacking animals of different ages. He objects, however, to the name given to the bacillus by Lignières and Spitz—*Actinobacillus*—on the ground that this involves the establishment of a new genus; and suggests the name of *Bacillus actinoides* for the organism he here describes, leaving it for future investigators to determine whether it is specifically identical with the bacillus of Lignières or not.

Sealed tubes are essential for the growth of the organism, and cultures must be renewed within a few days. Though its nature is unknown, it is suggested that the substance which forms the bulk of the radiate flocculi is probably a capsule, which is greatly overproduced in serum and scarce or absent on agar.

The organism is not appreciably pathogenic for mice, guinea-pigs, and rabbits. Intraperitoneal injections caused slight local peritoneal opacities and thickenings.

CANCER'S PLACE IN GENERAL BIOLOGY. W. C. McCARTY. *Amer. Nat.*
Vol. LII., Nos. 620-621. August-September 1918. 1p. 395-408. 7 Figures.

All multicellular organisms represent communisms of cells which have divided their labours and become specialised and differentiated

to form tissues. In the embryonic evolution of the tissues there are certain arbitrary stages of differentiation. During segmentation of the ovum the daughter cells do not show any of the special morphological characters of the adult tissues, but are nevertheless the forebears of such tissues, and may be called *prototextoblasts*. After these have assumed the positions of the subsequent tissues they become the immediate forebears of the tissues, and may now be called *textoblasts*. These, by differentiation and specialisation, develop into the tissue cells (*textocytes*) of the embryo and adult. Some of the cells, however, remain undifferentiated (*textoblasts*) in adult life and constitute reserve or regenerative cells for the specific tissues when the latter are destroyed. Thus Nature provides for the regeneration of most, if not all, tissues. The regenerative cells (*textoblasts*) in many animal and vegetable tissues respond to tissue-destruction in three degrees, namely, hypertrophy, hyperplasia, and migration. During hyperplasia, either with or without migration, the cells sometimes attempt to differentiate. If the hyperplasia is limited and the differentiation complete, the destroyed tissue is replaced. Unlimited hyperplasia without complete differentiation, however, produces the so-called malignant neoplasms.

"Cancer represents an unlimited hyperplasia of regenerative cells of tissues plus migration without complete differentiation. Regeneration (hyperplasia) without differentiation is a cytotypic protective process. Regeneration (hyperplasia) with differentiation is a textotypic process. Cancer is a cytotypic instead of a textotypic process. In Nature cytotypic protective processes are sometimes fatal to the communism of which the reactive cells are a part. All of the reactions may be designated by a simple biologic terminology which standardises clinical, histologic, and biologic facts."

THE STABILITY OF THE ACID-BASE EQUILIBRIUM OF THE BLOOD IN
NATURALLY NEPHROPATHIC ANIMALS AND THE EFFECT ON RENAL
FUNCTION OF CHANGES IN THIS EQUILIBRIUM. I. "A Study of
the Acid-Base Equilibrium of the Blood in Naturally Nephro-
pathic Animals and of the Functional Capacity of the Kidney
in such Animals following an Anæsthetic." W. DE B. MACNIDER.
Journ. Exp. Med. Vol. XXVIII, No. 4. October 1918. Pp.
501-516. 2 Plates (2 Figures), 2 Tables. II. "A Study of the
Efficiency of an Alkali to Protect the Naturally Nephropathic
Kidney against the Toxic Effect of an Anæsthetic." *Ibid.* Pp.
517-528. 3 Plates (3 Figures), 2 Tables.

The observations of Ophüls,¹ Pearce,² and Dayton³ have demonstrated the fact that many of the lower animals, particularly the dog,

are susceptible to a type of kidney injury which should be classed as a chronic nephropathy. Recently MacNider⁴ has studied naturally acquired chronic neophropathy of the dog, confirmed the earlier observations, classified the various nephropathic processes, and given consideration to the processes of repair in the kidneys. In the study of forty-two naturally nephropathic animals he found it possible, with three exceptions, to classify the kidney injury as a chronic productive type. The three exceptions showed the typical arteriosclerotic type of kidney, with extensive general sclerosis of the vessels. He has also⁵ inquired into the functional response of the naturally nephropathic kidney after the kidney had been injured by uranium nitrate or by an anaesthetic.

The present investigation has been undertaken with the object of ascertaining the difference in the response of the normal and naturally nephropathic kidney to Gréhant's anaesthetic. In the investigation nine of the dogs employed were healthy, and varied in age from eight months to six years and two months. Eighteen of the dogs were naturally nephropathic, and ranged in age from three years to thirteen years and one month. All the animals were kept under the same conditions.

The results of the investigation show that the naturally acquired chronic glomerulo-nephropathies of the dog are not due to an acid intoxication; but such an injury renders the acid-base equilibrium of the animal unstable and susceptible to an agent such as an anaesthetic which tends to induce an acid intoxication. Naturally nephropathic dogs, when anaesthetised by Gréhant's anaesthetic, the principal ingredient of which is chloroform, develop an acid intoxication, and become anuric and non-responsive to diuretic substances. The development of the anuria was constantly associated with swelling, vacuolation, and necrosis of the convoluted tubule epithelium. In the kidneys of these animals there occurred an accumulation of fat which, was mainly confined to the ascending limbs of Henle's tubules, and showed a quantitative relationship to the degree of acid intoxication.

It was found that a 0·9 per cent. solution of sodium chloride when given intravenously to anaesthetised naturally nephropathic animals is not effective in preventing the development of an acid intoxication and the associated kidney injury; but that a solution of sodium carbonate equimolecular with a 0·9 per cent. solution of sodium chloride when given intravenously confers a variable degree of protection to the kidney. The degree of protection is associated with the ability of the solution to maintain a normal acid-base equilibrium of the blood of the anaesthetised animal.

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¹ OPHÜLS, W., "Some Interesting Points in Regard to Experimental Chronic Nephritis," *Journ. Med. Res.*, 1908, xviii. 497.

² PEARCE, R. M., "An Experimental Study of Nephrotoxins," *Univ. Penn. Med. Bull.*, 1903-04, xvi. 217.

³ DAYTON, H., "Reliability of Dogs as Subjects for Experimental Nephritis," *Journ. Med. Res.*, 1914-15, xxxi. 177.

⁴ MACNIDER, W. DE B., "A Pathological and Physiological Study of the Naturally Acquired Chronic Nephropathy of the Dog, Part. I.," *Journ. Med. Res.*, 1916, xxiv. 177.

⁵ —— "A Pathological Study of the Naturally Nephropathic Kidney of the Dog, Rendered acutely Nephropathic by Uranium and by an Anæsthetic, Part II.," *Journ. Med. Res.*, 1916, xxxiv. 199.

PHARMACOLOGY AND THERAPEUTICS.

THE EFFICIENCY OF HÆMOSTATICS.

1. "The Effects of Various Agents on Superficial Hemorrhage and the Efficiency of Local Hemostatics." P. J. HANZLIK. *Journ. Pharmacol. and Exp. Therap.*, Vol. XII, No. 2. September 1918: Pp. 71-117. 3 Tables, 2 Charts.
2. "The Effects of Various Systemic Agents on Superficial Hemorrhage." *Ibid.* Pp. 119-128. 2 Tables, 1 Chart.

1. A number of agents are described in text-books on pharmacology and therapeutics as having hæmostatic properties, but the reputations enjoyed by many of them have been acquired empirically. The author, therefore, determined to investigate this class of agent by a method which would provide suitable controls and give a quantitative estimate of the comparative value of various agents. Hanzlik has previously (*Journ. Pharmacol. and Exp. Therap.*, 1918, x. 523) pointed out that inspection alone cannot give an accurate idea of the effects or the variability of hæmostatics when simply applied to bleeding wounds. He has, therefore, applied a method which consists of continuous irrigation of the denervated and incised foot-pad of the dog with a non-coagulant solution, with and without the hæmostatic, collecting the wash fluid for a definite period at intervals, and estimating a constituent of the blood in the wash-fluid. The results of his investigations with a large number of agents are summarised as follows:—

"Beginning with the most efficient, the order of efficiency of the more important hæmostatic agents tested is epinephrin, pituitary extract, tyramin, acetic acid, ferric chloride, quinin-urea-hydrochloride, tannin, sodium bicarbonate, barium chloride, cane-sugar, sodium chloride. A number of other agents, which were tried, can lessen local hemorrhage in variable degrees, but, on the whole, are inferior and undesirable for various reasons.

"The following among the more important of this class, and for which haemostatic claims have been made, were found to increase bleeding on local application:—Cotarnin salts (stypticin and stypol), antipyrin, peptone, emetin, sometimes alum. Orthoform (1 per cent. solution) also quite markedly increased local bleeding.

"Under the conditions, cephalin, coagulen, and thromboplastin were all variable, or did not affect the course of bleeding."

2. In order to make his investigations complete, Hanzlik tested various agents by introducing them into the circulation and noting their effect on the haemorrhage from the incised foot-pad. Dogs were used, and, as a rule, the drugs were injected intravenously; but in some instances they were administered intramuscularly and subcutaneously. Any effect produced by this method must depend on local action on the blood-vessels, exclusive of the central nervous system, or on the blood itself (such as viscosity, etc.), provided the blood-pressure remains unchanged. Changes in the pulse-rate and volume, unless profound, have practically no influence. The conclusions at which the author arrives are as follows:—

"The most effective haemostatic agent on superficial bleeding by systemic (intravenous) administration was epinephrin; tyramin somewhat less; pituitary extract was variable. Fatal doses of ergot and digitalis (one experiment each) also lessened and arrested, respectively, the bleeding.

"The effects of the following (systemically) on bleeding are roughly parallel to the changes in blood-pressure:—Coagulen (Ciba), cephalin (Howell), thromboplastin (Squibb), horse serum, stypticin, gelatin, saline, emetin, and possibly peptone. Nitrite and hydrastis increased bleeding with a fall in pressure. The results with the thrombo-plastic agents might be different with prolonged administration."

DAKIN'S SOLUTION AND DAKIN'S OIL IN THE NORMAL PERITONEAL CAVITY OF THE DOG. E. G. GREY. *Bull. Johns Hopkins Hosp.* Vol. XXIX., No. 332. October 1918. Pp. 221-223.

The author's observations are reported in order to draw attention to the fact that the indiscriminate use of the chlorin antiseptics is not entirely devoid of danger. The conclusions at which he arrives are as follows:—

"Both the neutral solution of chlorinated soda (Dakin's solution) and dichloramin-T in chlorinated paraffin (Dakin's oil), when injected into the normal peritoneal cavity of a dog, lead to an inflammatory reaction, the degree of which is directly proportional to the amount of chlorin antiseptic used. With a sufficient quantity (less of the oil suffices) death ensues. When either of the chlorin antiseptics is

injected into the gall bladder of a dog no abnormal symptoms appear. Following the injection of the oil, however, the gall bladder becomes thickened and shrunken, though the remainder of the biliary tract shows no discernible changes. A small amount of Dakin's oil, when injected into the normal pleural cavity of an unanæsthetised dog, may lead to a rapid (reflex ?) death.

"Since Dakin's oil, particularly, has been used without recognisable ill-effects in certain infections of the abdominal cavity, the results from the experiments outlined above suggest that the wall of an abscess cavity or sinus must play an important part in protecting the peritoneum in general from the effects of the free chlorin. They also suggest that the maintenance of an adequate drainage tract is an indispensable part of the technique for using antiseptics of this nature within the abdomen. Until more evidence is at hand, then, both of the chlorin antiseptics should be used in intra-abdominal infections with caution and certainly only in carefully selected cases."

PHYSIOLOGY.

THE INFLUENCE OF MAMMARY NUCLEO-PROTEIN ON THE SECRETION OF MILK IN THE COW (Ricerche sull' influenza del nucleoproteide di mammella sulla secrezione lattea delle vacche). R. GIULIANI. *La Clinica Vet.* Vol. XLI., No. 18. 30th September 1918. Pp. 463-477.

Mammary nucleo-protein was prepared from fresh, lactating glands according to the method recommended by Wooldridge. Four cows, seven and eight years old, were used in the experiment, during which they were maintained in identical conditions of surroundings, care, and feeding. The experiment lasted for thirty days, and was divided into three periods. During the first period of ten days the animals were observed without the administration of nucleo-protein. During the second period, or experiment proper, each received a subcutaneous injection of 10 c.c. of a saturated solution of nucleo-protein in a 1 per cent. solution of sodium carbonate. In the third period of ten days the quantity and quality of the milk was again observed without the injection of nucleo-protein.

The results of the experiment lead Giuliani to conclude that the subcutaneous injection of small doses of mammary nucleo-protein exerts a stimulating action on milk production, which is shown by a slight increase in the quantity and in the fat content of the milk. The stimulating action is of brief duration, and its effects are apparent only at the first milking after the injection.

POULTRY DISEASES.

POLYNEURITIS OF FOWLS (Contribución al estudio de la polineuritis de las gallinas). C. SANZ EGANA. *Revista Vet. Espana.* Vol. XII., No. 6. June 1918. Pp. 241-247. 1 Figure.

The author has encountered in Malaga a polyneuritis in fowls which he regards as due to "deficiency" or avitaminosis. The flock in which the disease appeared was kept exclusively for the purpose of consuming injurious insects, and had to live almost entirely on what food the ground provided. Occasionally a feed of seeds of sweet sorghum was furnished to them in special circumstances, but this was seldom.

The disease presented itself generally in a chronic form, and the first symptoms which indicated illness were pains in the legs and difficulty in walking. The gait was vacillating, with inco-ordination of movements. Little by little the paresis increased, the feathers were held erect, and the wings became involved and pendulous. Paralysis of the neck was accompanied by rigidity and contractures simulating those of tetanus, and there were manifestations reminiscent of those exhibited by a pigeon from which the cerebellum has been removed. Dysphagia accompanied paralysis of the neck. Respiratory symptoms (acceleration, dyspnoea) and general emaciation were very marked. General sensibility diminished greatly. In most instances the disease lasted from fifteen to forty days, but there were more acute cases in which death ensued in from five to eight days.

SEROLOGY AND IMMUNOLOGY.**BLACKLEG IMMUNISATION.**

1. "Improved Methods of Immunisation against Symptomatic Anthrax (Blackleg)," R. A. KELSER. *Journ. Agric. Res.* Vol. XIV., No. 6. 5th August 1918. Pp. 253-262. 8 Tables.
2. "Concentration of Symptomatic Anthrax (Blackleg) Toxin." W. H. BERG. *Ibid.* Pp. 263-264.

1. Since 1897 the Bureau of Animal Industry of the United States Department of Agriculture has distributed millions of doses of blackleg vaccine, prepared in accordance with the method of Kitt, this consisting in the attenuation of virulent muscle tissue by subjecting it to a temperature of 95° to 96° C. for six hours. There are, however, now two other preparations which will probably surpass in efficacy the

various other agents for immunisation against blackleg. One of these is the so-called "germ-free vaccin" or "natural aggressin." In 1912 Schöbl ("Weitere Versuche über Aggressininmunisierung gegen Rauschbrand," *Centralbl. f. Bakteriol.*, I. Orig. lxii. 296-304) announced his success in the immunisation of calves and guinea-pigs against blackleg by vaccination with sterilised oedematous fluid from animals that had died of the disease. Franklin and Haslam ("The Strength and Composition of Blackleg Vaccines," *Journ. Inf. Dis.*, 1916, xix. 408-415) have also emphasised the value, as a preventive, of an agent prepared on the same principle.

The second, and more recent, modern immunising agent is the toxic culture filtrate. Its origin rests upon the demonstration by Leclainche and Vallée ("Recherches expérimentales sur le charbon symptomatique," *Ann. Inst. Pasteur*, 1900, xiv. 202-223), and others, that the bacillus of blackleg, when grown under favourable conditions, produces a true toxin. It has been shown that susceptible animals may be effectively immunised by injection of small amounts of filtrates containing this toxin. Eichhorn in America ("Blackleg Filtrate," *Journ. Amer. Vet. Med. Assoc.*, 1917, li. 406-413; *Amer. Journ. Vet. Med.*, 1917, xii. 375-378; "Studies in Blackleg Immunisation, with Special Reference to Blackleg Filtrate," *Journ. Amer. Vet. Med. Assoc.*, 1918, lli. 653-663; this *Review*, 1917, I. 405), and Nitta in Japan ("Investigations on Blackleg Immunisation," *Bull. Centr. Vet. Med. Assoc. Tokyo*, 1918, i. 1-25; *Journ. Amer. Vet. Med. Assoc.*, 1918, liii. 466-482; this *Review*, 1918, II. 443) have called attention to the toxic culture filtrate.

Various forms of media, such as dextrose-veal bouillon plus cubes of beef, dextrose-veal bouillon plus sterile bovine serum, dextrose-liver bouillon, dextrose-liver bouillon plus cubes of beef, dextrose-veal bouillon plus calcium lactate, and dextrose-liver bouillon plus calcium lactate (the preparation of Nitta's "meat-piece or liver-piece broth" is described in the paper mentioned above) have been used for the growth of the organism and the production of the toxin; but Kelser considers that the best results are obtained with a modification of Martin's peptone bouillon, prepared as follows:—

"Fresh pig stomachs with their contents are obtained, and after trimming away the fat, are opened and the contents expelled. They are then lightly rinsed in water, care being taken not to wash away the gastric mucosa. The material is then cut in pieces of suitable size for a meat-chopping machine and finely ground. To every 200 grammes of this finely ground stomach tissue are added 1 litre of water at 50° C. and 20 c.c. of hydrochloric acid, C.P. This mixture should be made in glass flasks, and from here on up to the time the material is neutralised it should not come in contact with metal. The mixture

is placed in an incubator maintained at approximately 50° C. and allowed to remain there for twenty to twenty-four hours. It is then filtered through several thicknesses of cheese-cloth, heated to 80° C. to stop peptonisation, allowed to cool to 70° C., and neutralised to litmus. Flocculation occurs at this point, and the material is then filtered through cotton. Sterilisation is accomplished by autoclaving at 15 lbs.' pressure for twenty minutes.

"A piece of fresh beef is then obtained, and with as much precaution as possible, to prevent undue contamination, a thin layer is removed, taking all of the exposed surface of the beef. As much of the remainder as will be required is cut in small pieces and put through a meat chopper which has been previously boiled; 450 grammes of this ground beef and 10 grammes of dextrose are then added to every 1000 c.c. of the peptone solution. The flasks containing the medium are filled close to the cotton stopper in order to eliminate all the air space possible. The medium is then allowed to remain at refrigerator temperature for several hours, at the end of which time it is titrated against phenolphthalein and the reaction adjusted to 0·5, and is then sterilised by heating and maintaining it at a temperature of 65° to 70° C. for one hour on three successive days. It is then ready for inoculation." "The culture that gives good results is one twenty-four to forty-eight hours old, recovered from a guinea-pig which has been inoculated with virulent blackleg material."

Incubation for ten to twelve days appears to be the best for satisfactory toxin production. The product is then filtered through several thicknesses of cheese-cloth, next through a thin layer of asbestos wool, and finally twice through Berkefeld filters of "N" porosity. The filtrate is preserved with 0·5 per cent. chloroform, and stored in amber-glass bottles, which should be well filled. In order to determine whether the filtrate has been rendered free of organisms, it is tested culturally and by the administration of sublethal doses to guinea-pigs.

Contrary to what was formerly supposed, blackleg toxin is susceptible to the action of air, light, heat, etc., and suitable precautions should therefore be taken. "There is apparently a direct relation between the toxicity of the culture filtrate and its potency. Virulent bouillon cultures of the bacillus of symptomatic anthrax to which lactose has been added and which are then dried and pulverised give very satisfactory results as a test virus in standardisation tests of blackleg immunising agents on guinea-pigs. There is apparently a distinct difference between the immunising principle in blackleg natural aggressin and blackleg toxic culture filtrate."

2. Kelser, in the preceding paper, having pointed out the desirability of some uniformly satisfactory and practical method of isolating

or concentrating the blackleg toxin, Berg has made experiments with the intention of devising some such method. On a laboratory scale he has been successful in drying the toxin to a paste which resembles ordinary beef extract, and further experiments are being conducted on large scale drying and on the keeping properties of the paste. The method as described in the present preliminary paper is as follows:—

"Into each of several 9- or 15-cm. petri dishes 10 or 25 c.c.m. of the filtered toxin were transferred. These were kept overnight in a refrigerator at -9° C. (16° F.). The dishes containing the frozen toxin were then transferred to Hempel desiccators containing sulphuric acid, one large or three small dishes to one desiccator. The desiccators were evacuated with a Geryk pump to 2 to 3 mm. of mercury and then transferred to the refrigerator at -9° C., where they remained until the contents of the dishes had dried to a paste. This generally took from twenty-four to forty-eight hours. It is probable that the drying of this toxin must be accomplished while it is frozen; a few attempts at drying *in vacuo* at room temperature resulted in complete loss of toxicity. To some portions of the toxin, which was strongly alkaline, a calculated weight of acid potassium phosphate (KH_2PO_4) was added for the purpose of ascertaining the influence of neutralisation of the alkali on the keeping qualities of the toxin paste."

The dried paste, dissolved in water, was inoculated into guinea-pigs, and numerous tests indicated that there was little, if any, loss of toxicity.

THE IMPORTANCE OF SODIUM CHLORIDE IN AGGLUTINATION.

1. "Über die Bedeutung des Salzes bei der Agglutination." K. TAGAWA. *Journ. Coll. Agric. Tokyo.* Vol. III, No. 5. May 1918. Pp. 259-289. 23 Tables.
2. "Über die proagglutinoidähnliche Reaktion durch Hämoglobinlösung." *Ibid.* Pp. 291-297. 2 Tables.
3. "Weitere Studien über die Bedeutung des Salzes bei der Agglutination und ihre Anwendung zur Serodiagnostik des Rotzes." *Ibid.* Pp. 299-336. 7 Tables.

1. In his first paper Tagawa states the results of his investigations into the importance of saline solution in agglutination. These have caused him to adopt the following conclusions:—(1) For the commencement of the complete operation of immune agglutinins a certain proportion of salt is necessary; but the relation between the commencement of agglutination and the proportion of salt is never absolutely fixed. (2) The presence of salt is necessary for the commencement of normal agglutination, but a small proportion of salt suffices to engender a com-

plete reaction. (3) The operation of the so-called normal agglutinins does not depend, as has been stated, on specific receptors, but it appears that globulin and albumin play an important rôle. (4) An agglutination like a normal agglutination occurs with other albumins as well as with serum. (5) From absorption experiments it appears that normal agglutinin has no essential specificity, and the salt may be present or not. (6) Agglutinin can bind itself to the bacillus, as has been stated by Joos (*Zeitschr. f. Hyg.*, xxxvi. 400 and 427), but in this case the fixation is fairly weak. (7) Immune agglutinin chiefly effects the onset of agglutination if the immune serum is diluted with sodium chloride solution or distilled water. (8) It appears, as Eisenberg and Volk have stated (*Zeitschr. f. Hyg.*, xlvi. 155), that immune agglutinin has a greater affinity than normal agglutinin for agglutinogen. (9) The presence of a definite amount of salt is necessary for the complete combination of agglutinogen and immune agglutinin.

2. The author is also of opinion that the proportion of sodium chloride is of importance in the proagglutinoid reaction.

3. In his third paper Tagawa gives the results of his investigations as applied to the agglutination test for glanders. Details are given of numerous observations on the agglutination titre of serum diluted with various percentage solutions of sodium chloride, and it appears that, in order that error in diagnosis may be avoided, it is necessary to carry out two series of agglutination tests—one with serum diluted with a 0·85 per cent. solution of common salt, and the other with a 0·03 per cent. solution. The horse is healthy if the agglutination titre with the 0·03 per cent. solution is higher than that with the 0·85 per cent. solution. On the contrary, the horse is infected if the serum diluted with 0·03 per cent. common salt solution is the same or lower than that obtained with the serum diluted with a 0·85 per cent. salt solution.

SURGERY.

TEAT OPERATIONS. T. H. FERGUSON. *Journ. Amer. Vet. Med. Assoc.*
Vol. LIII, No. 5. August 1918. Pp. 659-661.

The use of the teat syphon by the cowman, if continued for any length of time, invariably ends in disaster. Hard rubber teat bougies and plugs also give unfavourable results. In all operations on the teat it is necessary to place the animal under proper restraint, and to carefully cleanse and sterilise the hands, teat, and instruments. The author favours the immersion of the teat, after cleansing, in etherised iodin. Injuries from treads, frost-bite, infection, etc., frequently give rise to

obstruction at the apex; the sphincter becomes swollen and blocks the canal. In such cases a teat bistoury, with the blade guarded, is passed into the teat above the swollen muscle, which is then divided three or four times at equal distances round the teat. Care must be taken not to penetrate the skin, or to cut the mucous membrane at the orifice of the teat. The operation is followed by the escape of milk through the teat, the remainder being removed by milking. Subsequently, the teat and milker's hands are cleansed and dipped in mercuric chloride solution 1:1000, and the teat is soaked after milking in the same solution. When the apex is severely injured, complete ablation of the teat may be practised.

Fibrous growths obstructing the teat canal are generally situated at the upper part of the middle third. The bistoury or curette affords only temporary relief. After injecting a 5 per cent. solution of cocaine and applying a rubber band as a tourniquet to the base of the teat, the latter is stretched and an incision is made down on to the growth, which is excised with probe-pointed scissors. The rubber band is cut two hours later, the wound being dressed with iodin and antiseptic powder. For a few days the escape of milk through the wound is sufficient to relieve the gland, after which hand-stripping must be resorted to. Complete stenosis of the teat canal, and atresia in heifers, may occasionally be cured by slitting the canal from base to apex, four incisions being made at equal distances. In heifers a large probe should first be introduced the entire length of the teat. Blocking of the canal with casein and blood-clots should be relieved by digital manipulation. The operation for fistula should be performed when the cow is dry; there need be no hesitation in casting when heavy in calf. A long self-retaining tube is inserted into the teat, a rubber band applied to the base, and the fistulous area is isolated and dissected out by making an elliptical incision down to the duct. Mattress sutures are applied, and the wound is dressed with iodin and collodion. The wound should heal by first intention. Supernumerary teats may be snipped off with scissors close to the udder, and the actual cautery employed to seal the wound.

(A. W.)

NEW OPERATION FOR "QUITTOR" (Note sur le javart cartilagineux (causes, traitement). Nouveau procédé opératoire). L. DESLIENS. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 319. July 1918. Pp. 297-315. 9 Figures.

In the first part of the paper the author discusses the incidence of quittor in army horses under the unfavourable conditions which obtain at the front. The trampled infected mud in which the lower limbs

are plunged for prolonged periods greatly favours the invasion of the coronary tissues by micro-organisms. Although traumatisms are of common occurrence, there may be no evidence of a wound, and the conclusion is arrived at that the impairment of the vitality of the skin is a frequent precursor of necrosis of the lateral cartilage.

A critical survey follows of the various operative procedures which have been practised prior to, and during, the war. (See this *Review*, 1917, I. 153, 407; and 1918, II. 331.)

The new method of approaching the cartilage by means of incisions in the coronary skin is as follows:—With the horse on the bed a deep groove is made in the wall at its upper border, extending the whole length of the cartilage, and the horn is thinned in the vicinity to expose the coronary matrix. The skin is then incised the same length as the groove a little above and parallel to it. At the anterior third of this long incision a second, short, perpendicular incision is made through the skin about 3 cm. in length. The skin flaps and the matrix are now dissected from the external surface of the cartilage and retracted with the aid of toothed forceps and hooks. The posterior, followed by the anterior, portion of the cartilage is removed in the usual way, the underlying fibrous tissue, when healthy, being left *in situ*. The next step consists in placing a gauze drain in the wound, projecting from its posterior extremity, and the skin flaps are united with silkworm gut sutures, two of which are inserted in the vertical and five in the horizontal incisions. This procedure may be adopted under the most varied conditions, if care is taken to modify the technique in accordance with the case. Thus, the presence of new cicatricial tissue in the coronary skin may alter the position of the vertical incision; a recent accidental wound may be extended without making fresh incisions; while the existence of a sand-crack suggests the performance of Fleuret's operation. In the latter instance only the long horizontal incision is necessary, and a small piece of skin, including the coronary matrix, is excised over the sand-crack, the drain being inserted at this point. When the lateral cartilage is ossified, its ablation is accomplished by grooving the border attaching it to the third phalanx with the medium-necked followed by the narrow-necked (French) shoeing knife. In the case of infected wounds the dressing is renewed five days after the operation, and a new drain is inserted, to be removed in a week's time.

Excellent results are claimed for the method. Drainage takes place at the heel at the lowest point, the wound granulates quickly, and the lameness soon disappears. The horse is ready for work in half the time required by the classic operation. Among 219 animals only one slight relapse occurred owing to a small piece of tissue being overlooked in the anterior portion of the cartilage. Not the least of the

advantages is the thorough exposure of the cartilage, which renders its complete removal an easy matter, while preserving the integrity of the articulation. Open joint is a rare accident.

(A. W.)

TRACHEOSTOMY (Della tracheostomia). F. CINOTTI. *La Clinica Vet.* Vol. XLI, No. 18. 30th September 1918. Pp. 457-462. 2 Figures.

Arguing from analogy, the author suggests that the term *tracheostomy* should be employed to designate the operation by which a permanent opening is made into the trachea. He recommends that the operation should be performed in the following manner:—The horse should be cast and, preferably, placed on his back, with the head and neck fixed in an accurately extended position relative to the body. The seat of election is in the upper fourth of the neck. The skin is shaved and a local anaesthetic applied. An oval piece of skin is incised, the long axis of the oval being about 6 cm. in length and corresponding to the long axis of the neck. The shorter transverse diameter should be about 3 cm. The segment of skin thus circumscribed is removed. The musculature of the neck having been exposed, an oval segment of the muscles, equal in extent to the piece of skin already removed, is excised with curved scissors. This is facilitated by first dissecting the muscles in the middle line of the neck. During the removal of the muscles it is imperative that the head and neck be held in exactly the correct position, otherwise there is the possibility that an unsightly deformity may be produced. The perichondrium over each of three or four tracheal rings is cut through, and segments of the cartilages shelled out of their perichondrial covering. That is to say, the internal perichondrium is left intact, so as to avoid injury to the mucous membrane. It follows that the segment of each tracheal cartilage must be removed separately. The mucous membrane is now incised in the middle line, and accurately stitched to the margin of the skin, care being taken that the sutures do not cut the mucosa.

THE VALUE OF FLAVINE: A CLINICAL APPRECIATION. H. M. SAVERY. *Brit. Med. Journ.* No. 3011. 14th September 1918. Pp. 283-284.

After devoting much attention to the treatment of septic wounds with flavine, Savery thinks that the reason why several workers have condemned the antiseptic is because of faulty method of application. His experience entirely corroborates that of Drummond and M'Nee

(*Lancet*, 1917, exciii. 640-643; this *Review*, 1918, II. 67), and Carslaw and Templeton (*Lancet*, 1918, exciv. 634-635; this *Review*, 1918, II. 338), that it is the early effect of flavine, which follows within several days after its application, that is the most important feature; the great advantage to be gained from its use at this stage does not seem to be sufficiently recognised. Savery lays emphasis upon three points:—(1) It is imperative that all affected parts should be reached as far as possible. He introduces the flavine solution by means of a hypodermic or dental syringe. (2) The flavine-soaked gauze should be applied as wet as possible, and any cavities filled up with the solution immediately before its application. (3) If the flavine solution be used continuously, a yellowish pellicle, apparently composed of leucocytes and fibrin, appears on the surface of the wound in the course of a few days. The appearance of the pellicle is an indication that a change of antiseptic should be made.

SURGICAL SHOCK.

1. "Contribution expérimentale à la thérapeutique du shock." M. D'HALLUIN. *C.R. Soc. Biol.* Vol. LXXXI, No. 17. 19th October 1918. Pp. 863-867.
2. "Étude expérimentale du shock et de son traitement par les injections intraveineuses d'huile camphrée." J. GAUTRELET and E. LE MOIGNIC. *Ibid.* Pp. 868-870.
3. "Les injections intra-veineuses d'huile camphrée." F. LOUET. *Ibid.* 1'p. 891-896.
4. "The Treatment of Standardised Shock. I." J. ERLANGER and GASSER. *Ibid.* Pp. 898-905. "The Treatment of Standardised Shock. II." *Ibid.* Pp. 905-909.
5. "Examination of the Brains of Shell-Shocked Dogs for Intra-vascular Fat." HOOKER and WEED. *Ibid.* Pp. 897-898.

1. D'Halluin distinguishes two degrees of shock—collapse and syncope. Collapse is an asthenic condition, characterised by weakness of the subject; often by loss, or at least diminution, of consciousness; sometimes by superficial respiration; and always by cardiac disturbance and a lowering of arterial blood-pressure. These symptoms may be aggravated and border on syncope, in which there is suspension of vital manifestations, arrest of respiration, and arrest of the action of the heart—the veritable prelude to death. He therefore distinguishes between the therapeutics of collapse and of syncope. In collapse it is necessary to act directly or indirectly on the heart, the vaso-motor system, and in certain cases on the respiration. Indirect action on the heart may be obtained by intravenous injections, and chloride of sodium

is a truly marvellous cardiac tonic. It must be used with caution, but the author has injected 20 c.c. of a 5 per cent. solution into dogs of average size without untoward event. It appears desirable to practise artificial respiration by rhythmic compression of the thorax. This acts as massage to the heart, and induces an artificial circulation, of which the importance is not negligible. But action on the heart is not of itself sufficient; it is necessary to overcome the vaso-motor paralysis. The author has experimentally obtained remarkable results in this respect by direct faradisation of the sciatic nerve. The intravenous injection of adrenalin has been extolled as having a happily combined action on the heart and as a vaso-constrictor, which raises the blood-pressure. D'Halluin has obtained good results, but not the marvellous success that has been claimed by some enthusiasts.

Syncope may be either respiratory or cardiac. Respiratory syncope may be combated by artificial respiration, but cardiac syncope is more serious. Experimentally, in dogs, resuscitation has followed simple mechanical excitation of the heart, but direct electrical stimulation of the myocardium is fatal.

2. Gautrelet and Le Moignic reaffirm their previous statement (*C. R. Soc. Biol.*, 1918, lxxxi. 519-521; this *Review*, 1918, II. 538) respecting the result of the intravenous injection of camphorated oil, and contend that it is the symptomatic medicament of choice in shock. It has not an elective action on the myocardium; still less is it a vaso-constrictor. It produces a repletion of the heart physiologically, by inducing hyperæmia of the lungs. Heitz-Boyer, Houzel, Ferrari, Constanti, Vigot, and Jeanneney have used the method of intravenous injection, and have obtained the happiest results.

3. Loüet reports very favourably after experience of the intravenous injection of camphorated oil in cases of severe wounds under actual war conditions. He agrees with Le Moignic and Gautrelet in their view of its mode of action, and states it as his opinion that the injection should be practised in all cases of serious wounds. The method (that of Le Moignic) is very easy, demands a restricted outfit, and takes very little time.

4. Erlanger and Gasser induced standard shock by the occlusion of the inferior (caudal) vena cava in such a manner as to attempt to maintain the arterial pressure at 40 mm. of mercury for two hours and fifteen minutes. They then observed the effect of the intravenous injection of certain solutions, and found that the best results were obtained by the injection of a glucose mixture. Animals treated with the British Committee solution, however, did almost as well, but those treated with a sodium carbonate mixture, if anything, did worse than animals that were untreated.

The authors then tested the efficacy of a mixture of acacia and glucose, and found that this had a distinct advantage. No bad effects were observed from the injection of the mixture, which markedly increased the blood volume. They feel justified in applying the injection of the mixture to actual cases of shock.

5. Hooker and Weed report that relatively large amounts of a substance (probably fat) was demonstrated in the cerebral vessels, particularly in the capillaries of the choroid plexus, in both shocked and control dogs. There was no apparent quantitative difference between shocked and control dogs. The distribution of droplets in the various choroid plexuses was not constant, but was perhaps more constant and in greater amount in the choroid plexus of the third ventricle than elsewhere.

TERATOLOGY.

INTESTINAL DIVERTICULA IN A HORSE (Diverse Darm-Konfluenzdivertikel beim Pferd). F. BÜRKI. *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 8. August 1918. Pp. 379-381.

In the course of a post-mortem examination of a horse which had died of peritonitis, Bürgi discovered three diverticula in connection with the large intestine. He regards them as being congenital. Two of them occurred in connection with the large colon, about 1 metre cranial to the pelvic flexure, and these were united to each other. The first was about 15 cm. long, with a lumen varying from 3 to 5 cm. in diameter, so that the intestinal contents could relatively easily pass into the diverticulum. The wall was composed of serous tunic and mucous membrane, and its thickness was barely 1 to 2 mm. The second diverticulum occurred 10 cm. from the first, and had thicker walls but a narrower lumen. Where it joined the cavity of the colon there was a constricted ostium which permitted the passage of a probe of the thickness of a lead pencil. Its length was about 10 cm., and it contained a bluish-grey material.

The third diverticulum was connected with the small colon about 1.20 metre from the rectum. It was 15 to 20 cm. long, and tapered to a blind end from a lumen which began about the width of a lead pencil. Its whole length contained material like inspissated pus.

TOXICOLOGY.

CASTOR SEED POISONING.

1. "Castor Seed (*Ricinus communis*) Poisoning in Horses." G. H. WOOLDRIDGE, *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 2, June 1918, Pp. 94-98.
2. "Poisoning of Horses with Castor Seeds." M. E. WHITE. *Ibid.* Pp. 98-100.

1. A stud of nineteen horses were fed with a mixture of oats, cut hay, etc., containing castor seeds. After the third feed with the mixture the least resistant of the horses began to show symptoms, and by the fifth day all the animals except three were ill. The symptoms were such as would be produced by an irritant convulsive poison. The primary symptoms were severe gastro-intestinal irritation with accompanying colic, diarrhoea in most cases, arrhythmic pulse, tumultuous heart action, and shallow and rapid respiration. At this stage either death took place or the severity of the abdominal symptoms abated, and remote effects, involving the nervous, cardiac, and muscular systems, asserted themselves.

In some of the animals symptoms resembling those of tetanus—hyperesthesia, muscular tremors and spasms affecting the throat, jaws, and tail—were manifested. Another peculiar feature was the stimulating effect produced on the reproductive organs, frequent erections of the penis of geldings and of the clitoris of mares being observed.

The symptoms became gradually less marked, and, after a prolonged illness involving much loss of condition, eleven of the poisoned horses ultimately recovered.

The treatment adopted was the hypodermic administration of ether and strychnin, followed by an electuary containing belladonna and magnesium and bismuth carbonate, to counteract the convulsive symptoms and to act as demulcents. Vegetable tonics and carminatives were prescribed later when the animals were becoming convalescent.

Three post-mortem examinations revealed in each a very severe gastro-enteritis. In one case there was in addition an intense congestion of the mesenteric vessels, and haemorrhagic spots in and around the mesenteric lymph glands. Husks of castor seeds were found in the alimentary canal.

2. At the local mill some "beans" were included in the mixture used by a farmer for feeding his horses. The mixture was fed to six horses at the home farm, and some was sent to an off-farm at a distance. A few hours after being fed the horses at the first farm became ill. In all cases the temperature was considerably elevated, the pulse-rate increased, and the respirations faster than normal. Small quantities of

fæces, hard, brown, and covered with mucus, were passed frequently. Severe purgation occurred in one case, which ultimately succumbed. At the second farm nine horses and two colts were fed with the mixture, in all of which symptoms of irritant poisoning were rapidly manifested. Effects remote from the alimentary system, such as laminitis and fainting fits, apparently of nervous origin, were observed.

At the post-mortem examinations gastritis and enteritis of a diphtheritic character, involving more particularly the small intestine, were revealed; while in one case there were petechial haemorrhages scattered along the length of the small bowel.

(W. C. M.)

ARSENICAL POISONING IN THE HORSE, WITH PULMONARY COMPLICATIONS.

R. H. SMYTHE. *Vet. Record.* Vol. XXXI., No. 1576. 21st September 1918. Pp. 90-91.

In the mining districts of Cornwall, and probably also in other counties where horses are worked in similar surroundings, there occurs a pulmonary complication in cases of chronic arsenical poisoning. The horses affected are those used in carting stanniferous ores and sand in those districts where tin-streaming operations are carried on. The animals are old and generally emaciated, and have often spent the greater part of their lives in the same surroundings. Thus they have become saturated with arsenic, and have acquired a tolerance for the poison. The indications of chronic arsenicalism are a dry, staring coat; alopecia in some advanced cases; brick-red discolouration of the mucous membranes, and general unthriftiness.

All the cases in which the acute symptoms described in the present paper have been seen are those in which horses have drunk from "mundic water"; that is, streams and pools where, in addition to tin ores, there are large quantities of iron compounds, notably red oxide and combinations of iron, arsenic, and sulphur. The horse becomes suddenly ill, and manifests symptoms of extreme dejection, with greatly accelerated respiration. "The breathing rapidly grows noisy, and more or less marked spasm of the glottis occurs, which occasions a prolonged snore at each inspiration. The conjunctival mucous membranes are congested, brick-red, and frequently protrude beyond the eyelids. The nasal mucous membrane is also congested and shows the same pronounced tint, whilst the nostrils are widely dilated. The inspiratory effort is somewhat prolonged, but the double expiratory movement common in emphysema is lacking."

Auscultation reveals an asthmatic condition due to the spasmotic contraction of the bronchi. A venous pulse may be noted. In the

majority of cases pulmonary congestion ensues, and the animal may die in a few hours.

"Fever is usually absent, and the animal exhibits no symptoms indicative of abdominal pain."

COMPARATIVE TOXICITY OF COTTONSEED PRODUCTS. W. A. WITHERS
and F. E. CARRUTH. *Journ. Agric. Res.* Vol. XIV., No. 10.
2nd September 1918. Pp. 425-452. 12 Tables, 5 Graphs.

Raw cotton-seed kernels and the gossypol therefrom have been found highly toxic to rats, rabbits, poultry and swine. Cooking the kernels under oil-mill conditions causes a great reduction in toxicity, the thoroughly cooked products showing no pronounced toxic effect on rats and poultry in suitable diets. Such thoroughly cooked meals, however, appear to be definitely injurious to rabbits and swine, which are peculiarly susceptible to cotton-seed meal "injury." Rats and fowls are able to withstand much larger relative amounts of the meal for longer periods. The degree of toxicity of cotton-seed meals depends on the thoroughness of cooking in the oil mill. This change, the authors say, appears to be due to oxidation of the gossypol to a substance which they call "D-gossypol." Some meals may be much more toxic than others, through failure to complete this change. Since evidence shows that the gossypol of the raw seed may be entirely changed to this far less toxic material, it is suggested that the highly toxic effect of the raw cotton seed be described as cotton-seed poisoning, and that injury due to the meal be described as cotton-seed-meal poisoning or injury.

[For an earlier paper on gossypol by the same authors, see this *Review*, 1918, II. 343.]

(R. G. L.)

REPORTS.

BOARD OF AGRICULTURE AND FISHERIES. ANNUAL REPORT OF THE CHIEF VETERINARY OFFICER FOR THE YEAR 1917. London: H. M. Stationery Office. 1918. Pp. 7. 2d. nett.

The number of suspected outbreaks of swine fever reported in the year 1917 was 10,261, and number confirmed was 2104. This is a decrease of 2227 as compared with 1916. Serum treatment was accepted in 1147 cases, involving 42,504 pigs. Of these 31·2 per cent. died of swine fever, 1·2 per cent. died of other causes, 25·7 per cent. were killed for food, and 41·9 per cent. were freed at the end of the outbreak. Serum treatment was not applied in 1384 outbreaks, involving 23,452 pigs. Of these 43·1 per cent. died of swine fever, 39·6 per cent. were killed for food, and 17·3 per cent. were freed. These figures show increases of 11·9 per cent. and 13·9 per cent. in the death-rate and pigs killed for food respectively, and a decrease of 24·6 per cent. in the pigs freed, as compared with the figures for the serum-treated outbreaks.

The total number of outbreaks of glanders among civilian horses in the calendar year was 25—a decrease of 19 outbreaks compared with 1916.

During the calendar year 423 outbreaks of anthrax were confirmed—201 in England, and 222 in Scotland. The number and species of animals affected were:—Cattle, 451; horses, 3; sheep, 3; pigs, 28; total 485, or 1·15 animals per outbreak. The disease occurred twice on 17 premises, and 3 times on 4 premises. That is to say, in 25 outbreaks on 21 premises disease may have arisen from a previous case in the same year. In all, 80 outbreaks (18·9 per cent.) occurred on premises on which anthrax was known to have occurred in former years. With regard to 343 outbreaks which occurred on previously clean premises, inquiries pointed to the following as being probable sources of origin:—

Effluent from tanyards or other industrial undertakings getting into streams	2
Feeding of infected carcass offal to pigs, etc.	1
Use of imported feeding-stuffs	203
Use of artificial manures of animal origin on the land	34
Use of both imported feeding-stuffs and artificial manures	49
A recent death, not reported, but not improbably anthrax	10
No explanation obtainable	44

The number of outbreaks which occurred in Scotland during the year was larger than the number which occurred in England. In Scotland, Lanarkshire contributed the largest number of outbreaks, namely, 16 per cent. of the total.

Sheep scab occurred in 34 counties in England, compared with 24 in 1916, 25 counties showing an increase and 9 a decrease in the number of outbreaks compared with 1916. In Scotland, 23 counties were implicated, being 2 more than in the previous year; 15 counties showed an increase and 8 a decrease in the number of outbreaks compared with 1916. In Wales, Pembroke was the only county in which the disease was not declared to exist. Seven counties showed an increase and 3 a decrease in the number of outbreaks as compared with the previous year. The Local Authority of Cumberland have made local regulations requiring the double dipping of sheep imported from Scotland. It is satisfactory to note that only 8 outbreaks in this county were attributable to Scottish sheep, compared with 17 and 28 in 1916 and 1915 respectively, and further, that no outbreak was traced to Scottish sheep after 24th May, the date on which the local dipping regulations became operative.

Owing to war conditions, parasitic mange of horses has shown a greater tendency to spread.

MINISTRY OF RECONSTRUCTION. REPORT OF THE AGRICULTURAL POLICY
SUB-COMMITTEE OF THE RECONSTRUCTION COMMITTEE. London :
H. M. Stationery Office. 1918. Pp. 136. 1s. 3d. nett.

"We wish to draw particular attention to the necessity for granting power to the Boards of Agriculture to check the use of bad sires. In our opinion no bull should be used to serve any cows but the owner's without a licence from the Agricultural Committee of a county, and the Boards of Agriculture should have power to order the castration of a bull so used. Most certainly no stallion should be allowed to serve any mares but its owner's, or to travel for the service of mares, without a licence from a Board of Agriculture. Such a regulation would do more than any other measure which can be suggested to improve the average quality of British horses. By these means bad bulls and stallions would be gradually eliminated and an immense improvement effected in the live stock.

"We wish to emphasise the importance of taking measures to deal with tuberculosis in cattle. It is a matter of common knowledge that this disease is widely prevalent, especially in dairy herds. It is generally recognised that this constitutes a danger to human health, and it is undoubtedly a considerable source of loss and waste in food production. On both grounds we urge that steps should be taken to

combat the disease. We are convinced that the use of the tuberculin test, while affording no guidance as to the severity of the disease in any animal, gives a trustworthy indication as to whether the tested animal is or is not entirely clear of tubercle, and thus supplies a line of division, on one side of which there is safety and on the other danger. We do not suggest that every animal 'reacting' to the test is, in any proper sense of the word, diseased. Still less do we propose that every reacting animal should be slaughtered or that its milk should be condemned. Indeed, we are aware that any such course would create a serious scarcity of milk. We think it, however, most desirable that farmers should be encouraged and enabled to do their utmost to reduce, and eventually to eradicate, tuberculosis in their herds by regular use of the tuberculin test and by such arrangements as may in each case be practicable to diminish the contact, especially in byres and cow-houses, of reacting and non-reacting animals. In order to bring this about, we suggest that the Boards of Agriculture should take steps to arrange for supplying the tuberculin test in herds whose owners desire it, either free of cost or at a very low rate of charge. We are convinced that farmers, having before them the object-lessons which such a course would undoubtedly afford, would be stimulated to make the greatest possible efforts to rid their herds of tuberculous infection in order to avoid the losses which it would be shown to entail.

"We recommend the resumption, when circumstances render it advisable, of the policy of the tuberculosis orders which were in force before the war. We further suggest that the possibility of a protective inoculation against tuberculosis should become the subject of careful research."

DEPARTMENT OF AGRICULTURE, CANADA: REPORT OF THE VETERINARY
DIRECTOR-GENERAL (F. TORRANCE, B.A., D.V.S.) FOR THE YEAR
ENDING 31ST MARCH 1917. Ottawa: J. de Labroquerie Taché.
1918. Pp. 19. 5 cents.

The health of Canadian live stock during the year 1916-17 has been fairly good, and the ravages of contagious disease in general have been restrained within narrow bounds, the statistics comparing favourably with those of previous years.

A slight reduction in the number of horses destroyed on account of glanders is noted as compared with last year, and, as before, the greater number of these were found in Saskatchewan, where conditions render eradication more difficult than in other parts of Canada.

Compared with the previous year, the losses from swine fever have been reduced by 18·8 per cent. Again, most of the outbreaks started from premises where raw garbage was fed to pigs. The use of serum

has been as extensive as circumstances would permit, and has resulted in a great saving to the country and to the pig-keeper. The serum used in the treatment of 7197 pigs cost \$4350, while the compensation saved to the Department of Agriculture amounted to \$72,000, and the value (estimated) saved to owners was \$144,000.

Dourine caused the slaughter of 48 animals.

Cattle mange remains confined to certain portions of Southern Alberta and South-Western Saskatchewan, the infected district comprising what is known as the "mange area." The movement of cattle from this area is under strict regulation. All cattle must be subjected to veterinary inspection and dipping, unless destined for immediate slaughter at an abattoir. Within the area, continual efforts are being made to eradicate the disease by systematic dipping. Progress is fairly satisfactory, and from time to time, as conditions warrant, the mange area is reduced in size.

Further experience of the operation of the new regulations relative to tuberculosis shows that a step in the right direction has been taken. It is gratifying to note the comparatively small expense incurred in removing tuberculous cows from the herds supplying milk to the two cities which have accepted Federal aid. Slaughter-house statistics show that tuberculosis in pigs has again increased, "and during the past five years has increased at the rate of 1 per cent. per annum, and is now at the alarming figure of 19·37 per cent. of hogs under Federal inspection. The figures for cattle do not show any corresponding increase, the percentage for the same five years remaining practically stationary. Conservation of food demands that this great loss of food, lost through condemnation of tuberculous meats, should be prevented by attacking the sources of infection and preventing the spread of the disease from cattle to hogs. This can be accomplished to a great extent by the sterilisation of the by-products of cheese factories and creameries."

BIHAR AND ORISSA. ANNUAL REPORT OF THE CIVIL VETERINARY DEPARTMENT (D. QUINLAN, M.R.C.V.S.) FOR THE YEAR 1917-18.
Patna: Superintendent, Government Printing. 1918. Pp. 8 + xiv. + 2. 1 Map. 8d.

Altogether 4923 reports of outbreaks of contagious diseases were submitted during the year against 4513 in 1916-17 and 3527 in 1915-16. No outbreaks of glanders were reported. Two deaths from surra occurred in Gaya, 2 in Hazaribagh, and 1 in Angul. Rinderpest was reported from all districts except Saran and Darbhanga. In the affected districts 14,390 animals died out of 33,979 attacked in 1058 outbreaks, although the disease was not so virulent as in the previous year. In Gumla subdivision, the outbreak appeared about

the beginning of the rains and did not subside until the end of November. In Cuttack the disease affected a large area in Tirtol and neighbouring thanas, and caused considerable mortality. This outbreak was the more difficult to deal with owing to the strength and persistence of local religious prejudice opposed to any kind of interference with the cattle.

Foot-and-mouth disease appears to have been very prevalent in Shahabad, Gaya, Ranchi, Cuttack, Puri, and Angul. The total number of animals affected was 77,895, of which 1041 are reported to have died. Haemorrhagic septicæmia was reported from all districts, and caused the highest mortality in Gaya. Black-quarter occurred in 6 districts, and anthrax in 9.

The number of animals protected against rinderpest by the "serum alone" method was 64,297, and the number of deaths among protected cattle was 302; but in one instance the death-rate was high owing to the veterinary assistant not using sufficiently large doses. In 41,811 animals inoculated against haemorrhagic septicæmia, 42 deaths occurred—a death-rate of 0·1 per cent. only. In protective inoculations against anthrax, 1 animal died out of 1729 inoculated: 1113 animals were inoculated against black-quarter, and 3 deaths occurred after inoculation.

A map showing the areas in the province where outbreaks of cattle diseases occurred in 1917-18 is a new feature of the Report.

DELAWARE COLLEGE AGRICULTURAL EXPERIMENT STATION. ANNUAL REPORT OF THE DIRECTOR FOR THE YEAR ENDING 30TH JUNE 1917. Pp. 28.

The Report contains a summary of experiments designed to show the cost of wintering brood sows on different rations. The sows were all pure-bred Berkshires, and, with the exception of three, were mature. The experiment lasted seventy days.

"During this time, Lot I. ate 225 lbs. of alfalfa hay and 1315·6 lbs. of corn. Lot II. consumed 549 lbs. of cut alfalfa hay and 1076·2 lbs. of hominy meal. Lot III. had 550 lbs. of silage, 560 lbs. of corn, and 448 lbs. of middlings, or a total of 1008 lbs. of grain; and Lot IV. used 756 lbs. of corn and 593·6 lbs. of middlings, a total of 1349·6 lbs. of grain. The weights of all the sows in the experiment were practically the same at the end as at the beginning of the trials. It is noted that in Lots I. and IV., where the pigs ate but little else than grain, the total grain consumption was 1315·6 lbs. and 1349·6 lbs. respectively; while in Lots II. and III., where 549 lbs. of cut alfalfa hay and 550 lbs. of silage were used, the amount of grain needed to maintain the sows was reduced to 1076·2 lbs. and 1008 lbs. respectively, a reduction of nearly 25 per cent. It is recognised, of course, that these figures are tentative."

REVIEWS.

THE HORSE AND THE WAR. By Captain SIDNEY GALTREY. Illustrated from Drawings by Captain LIONEL EDWARDS, and from Photographs. London: "Country Life." 1918. Pp. 131. 6s. nett.

Mr. Wells, in his book on *War and the Future*, says that, except perhaps as the parent of transport mules, he sees no further part henceforth for the horse to play in war. But Mr. Wells has apparently never seen much in the horse except as a polluter of the streets; and, if we are to believe the military people, he has come to more than one wrong conclusion. The sole reason for dragging Mr. Wells' name into the present review is because he is a man in the eye of the public whose opinion is indicative of that of a goodly number of folks. "But surely horses have ceased to be in modern warfare. One never, or very rarely, hears of cavalry. And isn't all the rest done by motors?" Those who know, and Captain Galtrey is one of them, will certainly say that the answer to that question is in the negative.

"What is the artillery that preponderates in modern warfare? The field gun, of course, which is the weapon of the Royal Field Artillery and Royal Horse Artillery. Each must have its own team of conditioned horses, and so when you count up the guns in a battery, the batteries in a brigade, the brigades in a division, the divisions in a corps, and the corps in our armies on all the fronts, you arrive at a first calculation of the vital necessity of horses and mules in many tens of thousands, the wastage among which has to be watched with the greatest care in order that the establishments prescribed may be rigidly maintained. For easy mobility and flexibility in rapid movement are vital and essential in the making of successful warfare.

"Then with the Artillery of every Division there must be a Divisional Ammunition Column, which means several hundred more animals, and again there is the Divisional Train Transport, chiefly horsed by weighty draught horses, while you must also bear in mind that every battalion of infantry has its own transport of at least half a hundred animals. Think also of the tremendous variety of other units (especially those connected with Machine Guns and the Royal Engineers) which go to make an army in being, each having horses or mules, or both, allotted to it. One has in mind Labour and Road Construction Companies, Railway Companies, Forestry Companies, units on Lines of Communication, and the Medical Service."

It is probably idle—it certainly should not be necessary—to point out that cavalry has played an essential *rôle* during the past few months in Palestine ; that this arm of the service was indispensable in Mesopotamia ; that it played a glorious part in the most glorious retreat that history has ever known ; that, looking beyond our own Army, the Russian cavalry did brilliant work in East Prussia during the opening phases of the war. There is no need for a mere reviewer to defend the cavalry.

But it is well that the general public should know something of what the horse means in the conduct of modern warfare apart from cavalry, and it would be difficult to imagine any writer better fitted, both by experience and facility of pen, to enlighten them than Captain Galtrey, who displays an enthusiasm tempered by good judgment. His articles in *Country Life* must have attracted the attention of all the readers of that publication, and they will doubtless be glad to have them collected together in book-form, with the spirited drawings of Captain Lionel Edwards to give them, if possible, a deeper interest. Written, as it is, for the general reader, *The Horse and the War* must not be expected to deal with the subject in all possible detail ; nor, written as it was before fighting ceased, can it contain definite and final statistics on many matters concerning which we should like to possess figures. These, perforce, belong to a *post-bellum* production. But the life of the horse and mule from the time of purchase for the Army until the day on which an auction of "cast" animals takes place is sufficiently minutely and sympathetically described.

We naturally turn to what the author has to say about the Army Veterinary Service, to which the prefix "Royal" has been so recently added. We may at once say that Captain Galtrey has nothing but praise for the Service, and we venture to hope and conclude that what he writes many others think.

"We at once get on terms of peculiar intimacy with the Veterinary Service and its splendid work in curing the sick and healing the wounded among our hundreds of thousands of dumb helpers when we come to visit their hospitals and learn something at first hand of the highly organised methods of filling and emptying them. Contemplate for a moment these figures and the unmistakable meaning they convey : 550,960 horses and mules admitted to the veterinary hospitals and convalescent horse depôts in France from the beginning of the war to the middle of February 1918, of which 394,768, or 71·5 per cent., were passed as cured, leaving 34,327 still under treatment. In the same period 16,215 died, and 106,650 were destroyed, cast, and sold, including those cast and sold to horse butchers. There was a time when 84 per cent. were cured and sent back into the fighting line. The percentage dropped to 80, then to 78 per cent., for it must be remembered that horses are getting older, while another factor in increasing the number of castings is the desire to retain in service only absolutely sound and workably sound horses."

The following story, vouched for as true, gives an interesting glimpse of the humorous, if occasionally slightly irritating, side of the duties of the Veterinary Service.

"This same A.D.V.S. was giving instruction to a class of officers who were concerned with horses in the field, and one enterprising member of the class volunteered the information that he thought he knew all there was to know. He had, for instance, carefully read Horace Hayes' *Notes on Horse Management*, and Fitzwygram's well-known book on *Horses and Stables*. 'Then,' observed the A.D.V.S., 'I suppose you can tell me how many bones there are in the horse's foot.' 'There are three,' promptly came the reply. The interrogator was naturally startled, and he had to investigate deeper and inquire the identity of the three. Our gallant officer obliged at once. 'They are,' he said, 'ringbone, sidebone, and navicular.'"

An interesting chapter deals with the Percheron horse in England. The introduction of stallions and mares from France, about two years after the outbreak of war, will doubtless be regarded in the future as one of the momentous incidents in the history of draught-horse breeding in this country. That the breeder of the Shire and the Clydesdale will not submit to the supplanting of their favourites without a struggle goes without saying; and it may be that the Percheron will be unable to make way in the contest. But whatever happens, the next few years will be full of interest for him who can watch events with detachment. He would be foolish who ventured to prophesy with assurance respecting the draught horse of the future; but there certainly seems to be a possibility that the Percheron will contribute not a little to the production of the future military horse of this country.

"The draught horse is the real horse of the war, and in this vital respect the resources of our country were hopelessly inadequate, and, it must be added, disappointing in regard to results. The heavy draught horse has been chiefly of the Shire-bred type, the impressive cart-horse of fine size, weight, and feathered legs fostered by the Shire Horse Society. One must be perfectly honest and say that they have failed to stand the strain, exposure, and hardship imposed by modern warfare. The fact is beyond all argument. It is the unanimous opinion of all who have been concerned with them, and it is the fact above all others which has primarily influenced that semi-official movement which we now see initiated on serious lines in favour of introducing the Percheron breed to this country."

A note from Sir Douglas Haig is added, in which he hopes that *The Horse and the War* will bring home to the peoples of the British Empire and the United States the wisdom of breeding animals for the two military virtues of hardiness and activity. For our own part, we hope that Captain Galtrey's book may be as widely read as it deserves.

VETERINARY SURGICAL OPERATIONS. By Major LOUIS A. MERILLAT, Senior, V.S., V.C., U.S.A. Second Edition. Chicago : Alexander Eger. 1918. Pp. 556. \$6 nett.

This work is the second edition of vol. iii. of Merillat's *Veterinary Surgery*, revised and enlarged, and to some extent rewritten, to bring it into line with recent advances in veterinary science. Major Merillat handles his subject in a masterly fashion, and expresses himself in concise and clear language, free from any ambiguity, in regard to operative procedures which he has found useful. No attempt is made to glance at other methods, a description of which might serve to confuse the reader, besides adding to the size of the book. Explicit directions concerning the minor details of surgical technique are given with each operation. These directions are repeated throughout the work, and they occupy a good deal of space which, we venture to say, might well have been devoted to certain alternative operative methods, of interest to the practitioner if not to the student. Attention to detail, one of the chief attributes of the surgeon, is emphasised and exemplified throughout the volume. Amongst so much that is excellent it would be strange indeed if certain passages could not be singled out for comment, not in any carping spirit, but rather to direct attention to the different views which prevail on some minor points on the other side of the Atlantic. In the Introduction, an operating theatre for the average practitioner is shown with a wooden floor, and a more or less permanent bed is laid down, portions of which are removed and renewed as required. The object, of course, is to keep down dust. Why not sail-cloths and straw, or gymnasia mats? Fig. 1 represents a canine operating table hinged to the wall to economise space. It is made of wood. Is white enamelled iron too luxurious for the purpose? On p. 47, circumscribed peritonitis is said to be a very common sequel of enterocentesis. This is not the experience in this country. Again, in tapping the rumen, peritonitis is stated to be a common result, while the operator is made to stand at the right flank. Discussing the indications and contra-indications for suturing wounds, the author rightly says: "When a wound has been, or is certain to become, infected with virulent micro-organisms, sealing it over by suturing the skin or other integuments is only shutting up the wolf in the sheep pen." The relative importance attached to firing and neurectomy for the cure or alleviation of chronic lameness is shown by the fact that the former is dismissed in twelve pages, while no less than sixty-eight pages are devoted to the latter. A fired horse appears to be viewed with grave suspicion by American horse-owners, and the sale of the animal is seriously prejudiced thereby. There will be general agreement with the observation that "the benefits of the operation lie largely in the fact that a protracted rest becomes necessary." In line-firing the hock, however, the lines are carried round the entire articulation; in Fig. 78 they pass almost transversely across the front of the hock. The after-treatment of the fired surface also cannot be characterised as a policy of non-interference. After forty-eight hours it is washed with

soap, hot water, and an antiseptic. The dry skin is smeared with vaselin daily for two weeks, the washing being sometimes repeated every third or fourth day.

The chapter on "Neurotomy" is exceptionally well written ; it contains minute directions for the performance of each operation, which cannot fail to appeal to practitioner and student alike. We fancy the word *neurectomy* is more appropriate, although it is true that only a small portion, and not the whole, of a sensory nerve trunk is excised. "Tenotomy and Myotomy" form the subject-matter of Chapter III. One naturally turns to the division of the flexor tendons, an operation which is largely restricted to the fore-limb, and which the author happily calls "metacarpal tenotomy." But the statement that "contractions of tendons from lesions in the tendons themselves seldom ever occur" will not meet with general acceptance ; nor can we agree that "a sprained tendon in the metacarpal region is not an indication for tenotomy." Chapter IV. on "Castration and Spaying" makes good reading. In the standing operation the emasculator is used, and the near testicle is selected first, owing to the tendency of the animal to kick on the side injured, particularly during the removal of the second testicle. In bulls the apex of the scrotum is cut off with a scalpel as in lambs, the tunica vaginalis is separated but not incised, and the ecraseur chain is applied high up over the cord still covered by the tunic. There follows an interesting account of the flank operation for spaying heifers on the American ranges. In this connection we may refer the reader to the abstract of an article on the "Spaying of Bovines in the Argentine," which appeared in this *Review*, 1917, I. 280. The author holds rather pessimistic views on the radical operation for cartilaginous quittor, and advocates simpler and more conservative methods which require less time and are seldom followed by bad results. He removes a crescent-shaped piece of hoof over the bottom of the sinus (indicated by the probe). A small piece of laminæ, and sometimes of the coronary matrix, is then excised, and a considerable portion of the cartilage, including the diseased area, is resected with knife and curette. The sinus is also curetted from above, syringed with tincture of iodin, and setoned with a strip of muslin. The best commentary on this procedure is to be found in the concluding sentence. He says : "The most common untoward result is the recurrence of the quittor from the onward progress of the inflammation to other parts of the cartilage, which event necessitates a second operation at the end of about forty days." In performing tracheotomy on the young horse, preference is given to the transverse incision through the connecting ligament, "as this method lessens the danger of causing a stenosis. In the young horse no other tracheotomy should ever be performed." The single old-pattern temporary tube is necessarily flattened from above downwards to admit of its insertion. It will surprise some British veterinarians to learn that general anaesthesia for Williams' operation for roaring has been discontinued by American practitioners. In another interesting and instructive article the author describes the aspiration of the stomach of the horse by means of the stomach-tube and

force-pump. It is recommended to pass the tube up the left nostril along the inferior meatus.

The volume is well bound and illustrated, printed on good paper, and convenient in size. It only requires a list of illustrations to make it complete. The book should find a place in every veterinary surgeon's library.

(A. W.)

MASTITIS OF THE COW. By SVEN WALL. Authorised Translation with Annotations by WALTER J. CROCKER, B.S., V.M.D., Professor of Veterinary Pathology, University of Pennsylvania. Philadelphia and London: J. B. Lippincott Co. 1918. Pp. xi. + 166. 12s. 6d. nett.

"Come at once cow bad Harrow-ways." "Thank you, no answer," and we crush the telegram in our hands and, turning, re-enter the surgery from which we have been summoned by the urgent ring of the messenger. He, regardless of the perturbation into which he has momentarily thrown us, mounts his red-painted bicycle and slowly rides away.

We also are soon on the road. The telegram gave us no information as to what is the matter with the cow, and so we have to take an overall and certain instruments, a milk-fever outfit, some drenches, and a long flexible rod to remove the piece of turnip, if such prove to be the difficulty.

Dusk is falling as we leave the village, and when we enter the solitude of *Lonely Flat* nothing is to be heard but the ring of the iron-shod hoofs of the horse beating out for us the motto of the "Northern Farmer": "Proputty, proputty, proputty, that's what I 'ears 'em saay." After a while the lights of Harrow-ways come into view, and presently the wheels of the trap rattle over the cobble-stones of the yard, while the watchdog, his barking checked, comes fawning round with teeth that gleam in the lamp-light.

"Cow's yonder," we are informed after civilities have been exchanged with the owner, and we make our way across the yard and enter the byre, in which we have not been long before our eyes smart with ammonia, and our glasses, if we wear them, become dimmed with steam. A match is struck, the lantern lighted, and its feeble glare enables us to make out the form of a cow. "Got a weed." Such is the laconic history with which we are furnished.

We examine the animal, give certain directions, and, promising to see the case in the morning, are soon on the road home again, our thoughts busily occupied with three questions to which we have already given tentative answers: "How long will it be before the cow is right again?" "Will the quarter be lost?" "Can we use the milk from the other quarters?" These questions cause us some concern, because we remember reading a statement by Dr. Moak (*Cornell Veterinarian*, April 1916, vol. vi. No. 1, p. 40): "It would be more attractive practice to treat and cure the one infected cow, and perhaps this may be done some day, but up to the present we frankly know of nothing to do for the infected cow except the

application of the usual treatment . . . as prescribed in good veterinary practice."

"Where may we look for help?" Ah! happy thought! perhaps the current issue of the *Veterinary Review* may have some reference to mastitis, and on arriving home we scan its pages eagerly. Yes! here it is! "Mastitis of the Cow," by Sven Wall (*Veterinary Review*, Vol. II. No. 4, p. 502), and though the price is high our need is urgent and we order the book. In due course it arrives, the cow doing well in the meantime. We find the book strongly bound, clearly printed, and poorly illustrated, and we turn at once to the chapter on the "Clinical Diagnosis of Mastitis" and are somewhat disconcerted to find it is immediately followed by a chapter on post-mortem technique. We have not read far before one sentence arrests us (p. 120):

"In tuberculosis the secretion is yellow, soft, caseous, and frequently contains calcareous granules which are easily felt by rubbing the pus between thumb and finger."

Fancy a surgeon doing that! What is the use of telling the cowman to wash his hands before milking if he sees the veterinary adviser rubbing tuberculous pus between his thumb and finger! In fact, speaking of the infection of udder wounds by the germs of tuberculosis our author says (p. 89):

"The contamination can be transmitted by straw, or the fingers of the attendants."

We should think so, indeed! In passing, we may notice that Mr. John Riddoch, M.R.C.V.S., Edinburgh, writing on "Actinomycosis in Cows' Udders" (*Journ. of Meat and Milk Hygiene*, June 1911, vol. i. No. 6, p. 324), says, speaking of the method of infection:

"The most probable cause is a habit which some dairymen have of putting a straw up the lumen of a teat when any obstruction to the flow of milk exists and thus bringing the organism from the straw direct into the milk sinus."

Also, in passing, we wonder how many practitioners would approve of the method of treatment for actinomycosis of the udder suggested in the book under review (p. 115). Reading on, we decide our cow is affected with "an acute genuine udder infection," and find such conditions "are severe in the beginning but are seldom fatal." That is comforting. "Usually repair is established by inflammation and sclerosis in a month" (p. 121). Prognosis, hopeful; duration, about a month. But the sclerosis rather suggests a lost quarter! We find a partial answer to our third question in the chapter on "Importance of Mastitis to Milk Control" (p. 138), and also on p. 50 ("Udder Streptomycosis").

The experienced veterinarian will find little to help him in respect of treatment in this book, but its perusal may interest him and lead to a closer clinical study of cases occurring in his practice; while the student will find it a useful introduction to the study of udder diseases, especially if he read in conjunction with the section on udder tuberculosis (p. 87) the

article by Sir John M'Fadyean on "Tuberculous Mastitis in the Cow; Its Pathogenesis and Morbid Anatomy and Histology" (*Journ. Comp. Path. and Therap.*, March 1917, vol. xxx. part 1, pp. 57-77 and June 1917, part 2, pp. 139-172).

The student should not accept the experiments recorded in this book as examples of "decisive animal experimentation." It is not clear that the udder was free from disease before inoculation (see p. 7, para. 6, and p. 87, para. 5), nor that the quarter used was itself always free (see p. 66, para. 10 *et seq.*, and p. 57, para. 4 *et seq.*). In connection with this latter experiment one is not surprised to read "staphylococci in great numbers" were found in the milk, considering that "twelve c.c." of a culture of staphylococci were injected the day before. Other references could be given.

Read the accounts and ask yourself, Was the udder given a fair chance? Are such injections to be considered as reproducing the conditions of natural infection? And if not, of what worth are they?

Much work on mastitis remains to be done; we cannot contemplate an acute case with an even mind. Improved methods of diagnosis are needed; specific treatment awaits discovery. In the meantime mastitis is a source of loss; less mastitis would mean more milk. What of the signs of the times!

"Agricultural policy is not sensational nor does it adapt itself to popular electioneering. In its practical aspects it is remote from illusory schemes of land nationalisation; it is a matter of science and clear businesslike deduction" (*Scotsman*, 29th November 1918).

If the right hand of Britain be Commerce and her left her Men of War; if her Brain be Science, her backbone is Agriculture, for the strength of a people is in their food. The cows in a thousand byres stand ready to play their part in our emancipation and to secure that never again shall Britain be apprehensive of the menace which lurks beneath the foam. All they ask is, we should remember they are living creatures and not machines, and when in our service they become ill we should spare no effort to make them well.

(D. C. M.)

PRINCIPES DE L'ÉVOLUTION DES MALADIES INFECTIEUSES. Par J. DANYSZ.
Paris: Baillière et Fils. 1918. Pp. 171.

The wise biologist is as a seeker after goodly pearls; he has in his possession various notions, hypotheses, and theories, any or all of which he is ready to exchange for better ones, and is always seeking one of great price which in the compass of a line and a movement shall solve the riddle of the Universe.

One of the more disconcerting conceptions of philosophy is that there is no death; no rest beyond the grave; but—

Our tireless atoms, in their ceaseless dance,
Shall, madder, prance; and, madder, prance.

Has it been said that Life, as we know it, stands somewhere between a tendency to freeze and a tendency to melt; between a ceaseless integration

and a no less incessant disintegration? Imagine for a moment a whirling column of sand; it is swept up into the air; it gyrates; the pressure is withdrawn and it falls; the column is not the particles nor yet the movement only, for, when the first are scattered and the second dissipated, the image thereof is retained by the percipient mind, and while it lives the recollection lives also. Herein are intimations of immortality; a worthy subject to stand beside those of disease and death, with which we are so much concerned.

Imagine a pair of Indian clubs resting on a table; a person enters the room and carefully places a third club beside the other two. Presently an athlete comes in, picks up the pair of clubs with no uncertain hand, tries their weight and poise, and then, having space, commences to swing them, at first slowly, later more rapidly, but always easily, till, after a while, a spectator's eyes are taxed to follow the intricate movements of the swinging clubs. And now someone picks up the third club and attempts to place it beside the whirling two. Crash! the rhythm is destroyed, the figure spoiled, and probably one at least of the clubs is injured. Why? they rested quietly on the table and it was the same club which caused the disaster. Certainly; but the time and the manner of its reintroduction to the other two were inopportune. Similarly you may inject an animal with a certain substance and, by taking care, permit the various things and forces to adjust themselves, so that no harm results; whereas if you introduce the same substance too rapidly there is no time for adjustment, and disaster follows.

"It is therefore necessary to conclude . . . that the rapid death of the animal indicates nothing as to the degree of toxicity of the injected substance" (p. 32).

A man may be choked by a glass of water.

"Every abrupt arrest; every rupture of equilibrium in this continuity of exchanges and in the passage between the *sol* and the *gel*; every tendency to stability in one or other of these states of which the instability is an indispensable condition of nutrition, will have for effect disturbances more or less serious according as this stability is more or less permanent, and the duration of the stability will be dependent on the doses or proportion of the coagulating agent" (p. 160).

Will you consider a third figure? Imagine a number of people forming a circle and walking round and round with even step and rhythmic swing. The hands on the outside of the circle are extended ready to be grasped when the occasion of the dance demands by other people standing ready to perform. The time arrives, the newcomers take their places quietly, easily, beside the others, grasp the extended hand of their partners and move smoothly on beside them, except one or two who rashly grasp the first hand they can find, either on the outside or the inside of the circle; they may even grasp an ear, so that some unfortunate performer finds himself with both his hands and perhaps his ears clutched by partners well meaning but foolish. He is overcharged with partners, his movements impeded, his dance spoiled, and possibly the whole combination may be ruined.

It is even so with the cells of the body. Occasions arise when a cell finds its affinities overtaxed ; it has combined with more material than it can digest ; it is replete ; discomfort to itself and inconvenience to the community result.

"Behold that which one is able to call the phenomenon of overcharge (*phénomène de surcharge*), that is to say, the ability of the antigens to combine with their antibodies in variable proportions" (p. 23 ; see also p. 50).

"In analysing the evolution of thought one observes that an individual is able to absorb only simple notions, and is able to assimilate them without effort only in identical proportions to those of his idea complexes" (p. 166).

New ideas must be received with caution ; they must be broken up into their simpler parts (digested) and then, their worth proved, they may be assimilated, may become part of our possessions, may break for us another Emersonian circle and enlarge our view.

Is the reader prepared to accept the ideas that disease may result as often from a cell indigestion as from a cell intoxication, properly so called : that time in dosing and quantity of material are as important often as the possibly poisonous character of the substance in causing disease?

That : "The pathological state in the infectious diseases is due to anaphylaxis" (p. 131).

"Anaphylaxis is an intracellular or intravascular indigestion or even both at once" (p. 131).

"Indigestion results from the inability of the organisms to rapidly transform colloid antigens into salts" (p. 131).

"An anaphylactic crisis is therefore nothing else but a crisis of indigestion" (p. 129).

"From the point of view of the evolution of the infectious diseases anaphylaxis must be considered as a pathological reaction of the processes of immunity" (p. 131).

"In what condition shall we find a hypersusceptible organism? It will be overcharged with antibodies" (p. 116).

Why must the cells of an organism produce this excess of antibodies?

"One is able to say that the reason for the production of antibodies in excess is the obligation which the organism is under to digest the colloids in order to render them assimilable or eliminable as amino acids, and this digestion provokes pathological manifestations when the compound of the antigen with the antibody yields a precipitate : that the compound is, on the contrary, completely neutral when it is soluble" (p. 117).

Decidedly a book to read, mark, learn, and inwardly digest, slowly and carefully, lest we suffer from a "surcharge" of ideas and mental anaphylaxis.

M. le Dr. Danysz concludes his work with pregnant words :

"A new theory, religion, a political or social system introduced too suddenly or in too high a dose to a people insufficiently or badly prepared produces always a rupture of normal equilibrium ; a pathological condition as serious in the souls of the individuals or of the community as too strong a dose of an antigen in the cell and in the body" (p. 167). (D. C. M.)

NOTES ON BOOKS.

COMMON DISEASES OF PIGS AND THEIR DIAGNOSIS. By ERNEST PEACEY, F.R.C.V.S. London: Baillière, Tindall & Cox. 1918. Pp. viii. + 114. 3s. 6d. nett.

The author states that the notes contained in this little book are the outcome of more than twenty years' practical experience, and he hopes that they may help the veterinary practitioner to arrive at a solution of the many problems that confront him in the exercise of his profession, and that they may be of equal assistance to the veterinary student and the stock-owner. Laboratory work receives only passing mention, as the author's aim has been to present a condensed account of the various diseases of swine as encountered in ordinary practice.

Sections are included on swine fever and its treatment with serum. No illustrations are included in this edition, but it is evidently the intention of the author to add them in any subsequent edition that may be called for. A useful index is appended.

REMINISCENCES OF A STUDENT'S LIFE AT EDINBURGH IN THE SEVENTIES. By ALISMA. Edinburgh: Oliver & Boyd. 1918. Pp. xv. + 115.

Those of our readers who sojourned in the Scottish capital for a while in the early seventies will doubtless be pleased to read this pleasant gossip of the notabilities of that city in those days. The book consists of a number of short sketches, and is evidently intended to be taken up in the few spare minutes which occur now and again in the course of even the busiest day. The author's style may be illustrated by a brief quotation: "Just let us turn for a few minutes to Princes Street at about four o'clock in the afternoon. Observe the well-dressed crowd of ladies and high-spirited officers and others taking their afternoon promenade along the really crowded footway. Observe, too, the gay carriages driving along; that alone was a splendid sight."

MAMMALIAN ANATOMY, WITH SPECIAL REFERENCE TO THE CAT. By ALVIN DAVISON, Ph.D. Third Edition, Revised by FRANK A. STROMSTEN, D.Sc. Philadelphia: P. Blakiston's Sons & Co. 1917. Pp. xi. + 243. \$2 nett.

When two editions of a book have been exhausted it is fairly safe to assume that in a measure it has fulfilled the purpose for which it was

intended. Davison's *Mammalian Anatomy* was produced as a guide to the student who wished to obtain a general idea of the structure of an easily procured mammal. Whether the student proposed to follow a later course of biological science or to enter the medical or veterinary profession mattered not. The dissection of the cat forms a preparation in any case. Dr. Stromsten claims that the text of the present edition has been thoroughly revised, though the general scope and aim of the former editions have been retained. When he further claims that "the B. N. A. nomenclature has been followed almost without exception," we are driven to the conclusion that the copy of the B.N.A. which we possess is singularly full of errors. But, after all, names are not things.

PRESENT-DAY OUTLOOK ON TUBERCULOSIS, BEING THE INAUGURAL ADDRESS DELIVERED ON THE INSTITUTION OF THE CHAIR OF TUBERCULOSIS IN THE UNIVERSITY OF EDINBURGH, 16TH APRIL 1918. By Professor Sir ROBERT W. PHILIP, M.D., F.R.C.P., F.R.S.E. Edinburgh : W. Green & Son. 1918. Pp. 20.

Sir Robert Philip thinks there is a future for vaccin-therapy, and "the remarkable success attained in the treatment of infections by organic arsenic compounds makes one hopefully anticipate similar developments from chemotherapy in the treatment of tuberculosis."

THE TUBERCULIN TEST. By WILFRED BUCKLEY and JAMES MACKINTOSH. London : The National Clean Milk Society. 1918. Pp. 13. 6d.

This is a small pamphlet intended for the instruction of owners of cattle who wish to rid their herds of tuberculosis. "The tuberculin test should only be applied by those qualified to do the work, but all owners of cattle should understand not only its value, but should have a certain amount of detailed knowledge of the subject."

INFECTION AND RESISTANCE. By HANS ZINNER, M.D. With a Chapter on Colloids and Colloidal Reactions by Professor STEWART W. YOUNG. Second Edition, Revised. New York : The Macmillan Co. 1918. Pp. xiii. + 585. \$4.25.

The section on anaphylaxis has been expanded, and a new chapter has been added on serum enzymes, leucocytic enzymes, the physical factors which enter into serum reactions, and colloidal gold reactions.

CHEMICAL PATHOLOGY. By H. GIDEON WELLS, Ph.D., M.D., Professor of Pathology in the University of Chicago and in the Rush Medical College. Third Edition, Revised and Reset. Philadelphia and London : W. B. Saunders Co. 1918. Pp. 707. 19s. nett.

Some articles, such as those on acidosis, anaphylaxis, and jaundice, have been rewritten. New sections on the Abderhalden reaction, specificity, atrophy, the pressor bases, and the chemical basis of growth have been added.

The value of the Abderhalden reaction as a test for pregnancy must be held as not yet proven.

ORGANIC COMPOUNDS OF ARSENIC AND ANTIMONY. By Professor G. T. MORGAN. London: Longmans, Green & Co. 1918. Pp. xx. + 376. 16s. nett.

The chemistry of such compounds as atoxyl, cacodyl, salvarsan, neo-salvarsan, luargol, the alipathic arsenicals, the aromatic arsenicals, etc., is dealt with, and the literature up to the end of 1917 is reviewed. An extensive bibliography is appended.

THE MAIN CURRENTS OF ZOOLOGY. By Professor W. A. LOCY. New York: Henry Holt & Co. 1918. Pp. vii. + 216.

The main movements in the development of modern zoology are discussed. In the chapter on insects these are considered as factors in the transmission of disease.

THE TREATMENT OF WAR WOUNDS. By W. W. KEEN, M.D., LL.D., Emeritus Professor of Clinical Surgery, Jefferson Medical College, Philadelphia. Second Edition. London and Philadelphia: W. B. Saunders Co. 1918. Pp. 276. 8s. 6d. nett.

CLINICAL DIAGNOSIS: A MANUAL OF LABORATORY METHODS. By JAMES CAMPBELL TODD, Ph.D., M.D., Professor of Clinical Pathology, University of Colorado. Fourth Edition, Revised and Reset. London and Philadelphia: W. B. Saunders Co. 1918. Pp. 687. 14s. nett.

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MEDICAL ELECTRICITY. By H. LEWIS JONES, M.A., M.D., F.R.C.P. Revised and Edited by L. W. BATHURST, M.D. London: H. K. Lewis & Co. 1918. Pp. xvi. + 588. 15s. nett.

EQUILIBRIUM AND VERTIGO. By Dr. I. H. JONES. With an Analysis of Pathological Cases by Dr. I. L. FISHER. Philadelphia and London: J. B. Lippincott Co. 1918. Pp. xv. + 444. 21s. nett.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA. Twentieth Edition, thoroughly Revised and largely Rewritten by Professor J. P. REMINGTON and Others. Philadelphia and London: J. B. Lippincott Co. 1918. Pp. cxxii. + 2010. £2, 10s. nett.

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A MANUAL OF CHEMISTRY, THEORETICAL AND PRACTICAL, INORGANIC AND ORGANIC. By Dr. A. P. LUFT and H. C. H. CANDY. Sixth Edition. London: Cassell & Co. 1918. Pp. xix. + 745. 12s. nett.

QUANTITATIVE CHEMICAL ANALYSIS. By FRANK CLOWES, D.Sc., and J. BERNARD COLEMAN, A.R.Sc. Eleventh Edition. London: J. & A. Churchill. 1918. Pp. 580. 12s. 6d. nett.

PRACTICAL CHEMISTRY FOR INTERMEDIATE CLASSES. By Professor H. B. DUNNICLIFF. London: Macmillan & Co. 1918. Pp. xii. + 277. 5s. nett.

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[*A note on a paper under this heading does not preclude a fuller abstract in a later issue.*]

ANATOMY

(Including Embryology and Histology).

CURTIS, G. M. "The Morphology of the Mammalian Seminiferous Tubule." *Amer. Journ. Anat.* Vol. XXIV., No. 3. September 1918. Pp. 339-394. 24 Figures.

Contains a description of the seminiferous tubules of the dog.

DE MOULIN, F. W. K. "The Development, Structure, and Significance of the Menisci of the Femoro-Tibial Articulation of the Domestic Animals" (Over de ontwikkeling, den bouw en de beteekens der menisci bij de huisdieren). *Proefschrift*, Utrecht. 1918. Pp. iii. + 134. 3 Plates (6 Figures).

CLINICAL.

BROOKE, W. H. "Purpura Hæmorrhagica." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 373-375.

In an aged mare there was swelling of the limbs and face. "The skin covering the fetlock, heels, and flexor aspect of the hind leg, front of both hocks, near shoulder, and outer femoral region of the near hind leg began to harden, and at points of junction with the normal skin it became divided through movement, from which the discharge issued. Later, the affected tracts of skin became drier and mummified, some of which was removed and in other places commenced to slough. With the skin separation, which involved all the originally swollen parts except the head, the general health improved."

BÜRKI, F. "Tuberculosis in a Cow with Epileptiform Attacks" (Tuberkulose bei der Kuh mit epileptiformen Anfällen). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 429-430.

Tuberculous lesions in the mediastinal glands, lungs, liver, spleen, kidneys, and peritoneum. Macroscopically the brain was normal. The epileptiform attacks were either due to toxic absorption or to ataxic irritation of the brain.

— "Intestinal Perforation and Necrosis following Parturition" (Darmquetschung und Nekrose infolge Geburt). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 428-429.

Septic metritis in an eight-year-old cow, with perforation and necrosis of the small intestine. It is assumed that, during the delivery of a large fetus, the intestine had been crushed against the wall of the pelvis.

— "Metastatic Abscess and Omphaloarteritis in a Calf" (Metastatische Abszesse einer Omphaloarteritis beim Kalb). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. P. 431.

Pneumonia, pleurisy, omphaloarteritis, and osteomyelitis of and abscess in the ramus acetabularis ossis ischii. In the pus from the artery and the abscess were found *B. necrophorus*, Gram-positive cocci, and what were probably *B. coli*.

— "Fracture of the Femur during Birth" (Femurfraktur beim Foetus während der Geburt). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 430-431.

CLARKSON, M. "Case of Staggers in Horse." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 331-332.

CROCKER, W. J. "Inguinal Hysterоcele." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 777-778.

"A five-year-old bull bitch presented a firm swelling the size of a human fist, which had existed for a period of several months, in the right posterior mammary gland. The condition was diagnosed as a neoplasm of the mammary gland." On post-mortem examination the greater part of the right cornu and round ligament of the uterus, and part of the omentum, protruded from the right inguinal canal. The canal itself contained the rest of the right uterine cornu, together with the mammary vessels and nerves.

DRENNAN, R. E. "A Peculiar Case of Emaciation in a Horse." *Vet. News.* Vol. XV., No. 774. 2nd November 1918. Pp. 378-379.

The writer of the note found (in a ten-year-old Clydesdale gelding) "multiple abscesses of very large size all over his thoracic and abdominal

cavities, particularly in the mediastinal glands. The kidneys were practically imbedded in pus. The liver and mesenteric glands were full of abscesses." There was no previous history to account for the condition.

EVE, H. B. "The Evil Results of Blistering." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 365-367.

— "Post-Partum Infection in the Sow." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 367-368.

— "Scurvy (Scorbutus) in Young Pigs." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 368-369.

HOARE, E. W. "A Dentigerous Cyst." *Vet. News.* Vol. XV., No. 767. 14th September 1918. P. 22.

A perfectly formed molar tooth was removed from the temporal region of a three-year-old gelding.

— "Two Interesting Cases in Canine Practice." *Vet. News.* Vol. XV., No. 769. 28th September 1918. P. 339.

The writer thinks that one of the cases was probably canine typhus, with chronic kidney lesions. The post-mortem examination of the second case revealed enlargement and passive congestion of the liver, dilatation of the right side of the heart, and an enormous dilatation at the commencement of the colon, with the accumulation of small pieces of bone.

— "An Obscure Case." *Vet. News.* Vol. XV., No. 772. 19th October 1918. Pp. 362-363.

Rupture of the colon in a horse.

HODGKINS, J. R. "Obstructed Breathing Due to a Cyst." *Vet. Journ.* Vol. LXXIV., No. 11. November 1918. Pp. 398-400. 1 Figure.

In a heavy draught mare a cyst was present just below the larynx and above the trachea. On removal the cyst was found to be ovoid in outline, weighed 6 lbs. 2 ozs., measured $10\frac{1}{2}$ ins. by 7 ins., possessed a thin transparent wall, and contained $4\frac{1}{2}$ pints of an odourless fluid, brownish in colour with an olive-green tint, recalling that of bile.

HOWIE, G. "Cutaneous Asphyxia in Bull." *Vet. News.* Vol. XV., No. 775. 9th November 1918. Pp. 387-388.

"Three days previously this bull had been dressed all over his body—every inch of it—with a mixture of sulphur, soda carbonate, and fish oil as a remedy for scab." Two possible theories suggested themselves:—" (1) The possibility that the fish oil had been adulterated with some poisonous sub-

stitute, which had been absorbed through the skin, thus giving rise to the distressing symptoms. (2) The possibility that the oil, though pure, had been so thoroughly applied as to completely clog up the pores of the skin, and completely prevent the loss of heat and waste materials of combustion through the skin."

JONES, R. "Spring-Time Cases." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 369-371.

Relates the case of a mare in which there was eversion of the urinary bladder after three consecutive foalings.

LOTHIAN, W. "Wind-Sucking in a Cow." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. P. 365.

The note refers to a four-year-old half-bred Ayrshire cow, in which the act of "wind-sucking" was observed oftenest at night after the animal had been watered and fed on cake. The cow was in nice condition and good health.

M'BIRNEY, J. "An Interesting Case, probably of Milk Fever Complications." *Vet. News.* Vol. XV., No. 780. 14th December 1918. Pp. 426-427.

MARTINEZ HERRERA, C. "Antepartum Paraplegia in a Pig" (Paraplegia antepartum en una cerda). *Revista Hig. y Sanidad Pecuarias.* Vol. VIII., No. 10. October 1918. Pp. 636-637.

The complete recovery of the animal after parturition leads the writer to think that the cause was mechanical.

PARKER, J. H. "A Lame Horse." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 330-331.

QUENTIN. "Thrombosis of the Aorta in a Mare" (Note sur un cas de thrombose de l'aorte postérieure chez une jument). *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 414-415.

VIGNON. "Invagination of the Cæcum" (Une invagination du cæcum). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 321. September 1918. Pp. 438-440.

A fifteen-year-old horse suffered from severe colic. In spite of the administration of appropriate remedies in large doses the pains continued without intermission, and were so acute as to produce veritable convulsions. On post-mortem examination the cæcum was found completely invaginated into the first part of the large colon, where it formed an enormous gelatinous, blackened, conical mass.

YATES, G. "Hodgkin's Disease in the Dog." *Vet. Record.* Vol. XXXI., No. 1575. 14th September 1918. Pp. 81-82.

The writer of this note states that he has seen four cases of Hodgkin's disease in dogs during twelve months. Some details of the cases are given.

DIETETICS.

"An Experiment in Pig Feeding." *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVIII., No. 4. November 1918. Pp. 472-474.

"The general result of this experiment is that 1 ton of potatoes is equivalent to 2·21, or say $2\frac{1}{4}$, tons of swedes for pig-feeding."

BIRCH, R. R. "Garbage Feeding, and the Care of Garbage-Fed Swine." *Report N. Y. State Vet. Coll.*, 1916-17. 1918.

BOULUD. "Amount of Total Nitrogen in Two Samples of Bran" (Dosage de l'azote dans deux échantillons de son). *C. R. Soc. Biol.* Vol. LXXXI., No. 18. 26th October 1918. Pp. 912-913.

One sample contained 2·11 per cent. of nitrogen, the other 1·93 per cent.

CARROLL, W. E. "Feeding Farm Animals." *Circular No. 32.* Utah Agric. Coll. Exp. Station. September 1918. Pp. 23. 8 Tables.

Tables are appended giving the requirements for growth with no considerable fattening, requirements for fattening per head and day, requirements for milk production, requirements for work production by the horse, values per 100 lbs. for ruminants, horses, and pigs, and the relative value of feeding-stuffs based on their content of digestible matter, net energy, and feed units.

FISH, P. A. "Vitamines and Nutrition." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 17-22.

"Although the domesticated animals are doubtless less susceptible than the human to so wide a range of deficiency diseases because of less interference with the natural ration in the way of cooking, etc., it is well to remember that a perfectly balanced ration of pure proximate principles or a ration properly constructed as to its calorific or fuel value is not sufficient to sustain life satisfactorily if the vitamine content is deficient. It has been reported that certain prepared foods have caused digestive disturbances. It is reasonable to infer that, as in human nutrition, vitamines must be considered. When research has advanced sufficiently, it is not unlikely that it will be shown that dietetics play quite as important a part as therapeutics in safeguarding animal health."

HENDRICK, J. "The Composition and Food Value of Bracken Rhizomes." *Scottish Journ. Agric.* Vol. I., No. 4. October 1918. Pp. 423-430. 2 Tables.

MAYALL, G. "Sea-weed." *Vet. Journ.* Vol. LXXIV., No. 11. November 1918. Pp. 401-403.

NEIDIG, R. E. "Acidity of Silage made from Forage Crops." *Journ. Agric. Res.* Vol. XIV., No. 10. 2nd September 1918. Pp. 395-409. 4 Tables.

"Previous investigations showed that all samples of high-class corn silage contain lactic, acetic, and propionic acids, the non-volatile lactic acid usually occurring in excess of the sum of the volatile, acetic, and propionic acid. The crops and crop mixtures under examination which showed an acid fermentation similar to corn silage are as follows:—Oats and peas in any proportion; oats; peas; wheat and peas; clover; clover and wheat straw. Crops and crop mixtures under examination which did not develop an acid fermentation similar to corn, and were unfit for feeding purposes, are as follows:—Alfalfa, unless fed soon after siloing; alfalfa and wheat straw. Butyric acid was always found in samples of spoiled or partly spoiled silage."

PETERS, W. H., and GEIKEN, D. J. "Pork Production in North Dakota." *Bull. No. 127.* North Dakota Agric. Exp. Station. July 1918. Pp. 255-278. 13 Figures, 4 Tables.

SWANSON, C. O., and TAGUE, E. L. "Chemistry of Sweet-Clover Silage in Comparison with Alfalfa Silage." *Journ. Agric. Res.* Vol. XV., No. 2. 14th October 1918. Pp. 113-132. 10 Tables, 5 Graphs.

"Most of the acidity is developed in the first fifteen days. Adding corn meal to sweet clover increases the amount of acidity in the resulting silage. . . . The amount of amino nitrogen in silage made from alfalfa alone is notably larger than that made from sweet clover alone. . . . The nitrogen in amid form was approximately one-half of the total. Approximately two-thirds of the total nitrogen in silage is soluble in water and 50 per cent. alcohol, the solvent action of the two being nearly the same. From the various data presented, it appears that silage can be made from sweet clover alone with less difficulty than with alfalfa alone."

WIGDOR, M. "A Study of the Character of the Feces Due to Various Foods in Connection with Anthelmintic Investigation." *Amer. Journ. Vet. Med.* Vol. XIII., No. 9. September 1918. Pp. 441-444.

GENERAL.

BRENTANA, D. "Notes on the Condition of Agriculture and Zootechny in the Invaded Italian Territory" (Alcune notizie sulle condizioni agricolo-zootecniche delle terre invase). *Il Moderno Zooiatro*. Parte Sci., Ser. V. Vol. VII., No. 8. August 1918. Pp. 169-177.

BRUCE, J. L. "Pedigree Live-Stock. Development of Breeding in New Zealand." *Journ. Agric. N. Z.* Vol. XVII., No. 2. August 1918. Pp. 65-70.

"If the foregoing statement of our position and claim to rank in the forefront as a pedigree-stock-raising country is not too optimistic, we stand well to become the nursery and distributing centre for pedigree stock in the Pacific, as Britain has been and still is for the world."

CASTEJON, R. "Modern Ethnology and the Theory of the Origin of Species" (Los modernos conocimientos de la etnología. Relaciones de estas nuevas adquisiciones con las teorías el origen de las especies). *Rerista Hig. y Sanidad Pecuarias*. Vol. VIII., No. 9. September 1918. Pp. 561-575.

CENSI MANCIA, G. B. "Size, Live Weight, Dead Weight, etc., of Italian Sheep" (Pecore Garfagnine e Pisane di colle (Misure somatiche esterne, peso vivo, peso morto, peso dello scheletro, peso totale della carne e loro rapporti con organi interni)). *Il Moderno Zooiatro*. Parte Sci., Ser. V. Vol. VII., No. 7. July 1918. Pp. 158-168. *Ibid.* No. 8 August 1918. Pp. 177-192. 14 Tables.

CIANI, G. "A New Frost Shoe for Saddle Horses" (Di un nuovo ferro da ghiaccio particolarmente indicato per il cavallo da sella). *La Clinica Vet.* Vol. XLI., No. 19. 15th October 1918. Pp. 491-497. 7 Figures.

DERRÉ, J. "The Cattle of French West Africa" (Le bétail de l'Afrique occidentale française: Utilisation commerciale et rendement). *Rec. Méd. Vet.* Vol. XCIV., No. 19. 15th October 1918. Pp. 513-523. 6 Figures.

FERGUSON, J. J. "The Live Stock Industry, Present and Prospective." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 8-17.

"The veterinarian should proceed more along the lines of preventive medicine than he has done in the past."

HOARE, E. W. "On Some Points in Connection with Warranty in Cattle." *Vet. News.* Vol. XV., No. 777. 23rd November 1918. Pp. 402-404.

"A certificate of the animal having successfully gone through the tuberculin test is not a warranty, and every veterinary surgeon is aware that the test is not infallible. But when the buyer demands a warranty of freedom from tuberculosis in the case of a valuable animal, the seller should decline to give it, and should explain that, if required, a certificate of the tuberculin test can be obtained."

LAPICQUE, L. "Number of Cattle Needed in the Reconstruction of Invaded French Territory" (Proportion du cheptel bovin français à reconstituer dans le territoire envahi). *C. R. Soc. Biol.* Vol. LXXXI., No. 21. 23rd November 1918. Pp. 1110-1111.

The writer calculates that, in round figures, 900,000 cattle of all ages are required to reconstruct the French territory invaded by the enemy. This is between 6 and 7 per cent. of the former total cattle population.

M'LEAN, C. C. "Swine Practice." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 90-92.

"Swine—undoubtedly the most naturally intelligent and the cleverest of any of our domestic animals, the animal that can only be fooled once, and the animal that can find its way home even when removed as young as four weeks—are still the most abused and neglected of any of the members of the animal kingdom."

MOHLER, J. R. "The Bureau of Animal Industry as a War Auxiliary." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 96-107.

"Data compiled by the Department of Agriculture show losses of \$75,000,000 in 1914 from hog cholera and about \$32,000,000 for the year ending 31st March 1918. These figures show a reduction of over 50 per cent. in the losses in less than five years. [Compare these figures with those given by Houck, this *Review*, 1918, II. 381.] . . . It is estimated that the annual losses from animal tuberculosis amount to at least \$25,000,000. . . . The report covering the co-operative tuberculosis eradication work in the various States during the month of June shows that the operations have been extended to 32 States. Headquarters have been established in 17 important centres, from which the work is supervised and directed. During the month of June, 74 Federal employees and 58 State employees were engaged in the field work. There were over 16,000 cattle tested, which was an increase of 700 over the number tested during the previous month."

MORGAN, E. "The British Flockmaster's and Veterinary Surgeon's Outlook. A Plea for Increased Sheep Breeding." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 358-364.

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POTTIE, J. D. "Cruelty to Animals." *Vet. News.* Vol. XV., No. 765. 31st August 1918. P. 306.

R. V. DE E. "The British Army Veterinary Service" (*El cuerpo de veterinaria militar del ejército inglés*). *Revista Vet. Espana.* Vol. XII., No. 7. July 1918. Pp. 289-297. 4 Figures.

TURNER, J. P. "The Veterinary Service of the Army of the United States." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 126-136.

WELCH, W. H. "Needed Changes in Stallion Registration." *Amer. Journ. Vet. Med.* Vol. XIII., No. 9. September 1918. Pp. 423-429 and 471.

Registration in the State of Illinois is criticised.

WHITE, T. P. "Parsing the Veterinarian (Past, Present, and Future)." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 30-33.

"The veterinarian of the future will necessarily be a sanitarian in addition to other qualifications. We are entering into a period of prophylaxis, and the application of sanitary measures and formulae in the prevention of diseases of animals as well as of the human family will be the chief factor in the protection of health."

GENETICS AND HEREDITY.

GOWEN, J. W. "Studies in Inheritance of Certain Characters of Crosses between Dairy and Beef Breeds of Cattle." *Journ. Agric. Res.* Vol. XV., No. 1. 7th October 1918. Pp. 1-57. 6 Plates (17 Figures), 30 Tables.

LATHROP, A. E. C., and LOEB, L. "Further Investigations on the Origin of Tumors in Mice. V. The Tumor Rate in Hybrid Strains." *Journ. Exp. Med.* Vol. XXVIII., No. 4. October 1918. Pp. 475-500.

"The results of these investigations confirm our previous conclusion that in the majority of the crosses which we observed, the cancer rate is either intermediate between those of the father and mother strain, or that it follows

the tumour rate of the parent with the higher rate, and only in a relatively small number of instances the cancer rate follows that of the parent strain with the lower tumour rate. On the whole, the heredity of cancer rate and cancer age follows the blending type of hereditary transmission. While there is a distinct relation between the high tumour rate and early cancer age, our observations make it probable that cancer rate and cancer age are to some extent independent of each other."

ROBERTSON, W. A. N. "A Contribution to the Study of Hereditary Unsoundness in Horses." *Journ. Dept. Agric. Victoria.* Vol. XVI., No. 5. May 1918. Pp. 289-303.

HISTORICAL.

CHECCHIA, N. "A Fifteenth Century Italian Farrier" (Un maniscalco del '400). *Il Moderno Zootutto.* Parte Sci., Ser. V. Vol. VII., No. 9. September 1918. Pp. 203-207.

Refers to the writings and teachings of Agostino Colombe.

GOLDBERG, S. A. "Historical Facts Concerning the Pathology of Spavin." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 745-756.

Contains an account of the views which have been held by writers in the past.

HYGIENE AND PREVENTIVE MEDICINE.

FREI, W., and KRUPSKI, A. "The Examination of Tinned Meat" (Zur makroskopischen und bakteriologischen Untersuchung und Beurteilung von Büchsenfleisch). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 10. October 1918. Pp. 445-470.

PRUCHA, M. J., and WEEETER, H. M. "Germ Content of Milk. I. As Influenced by the Factors at the Barn." *Bull. No. 189.* Univ. Ill. Agric. Exp. Station. May 1917. Pp. 23-55. 3 Figures, 18 Tables.

PRUCHA, M. J., WEEETER, H. M., and CHAMBERS, W. H. "Germ Content of Milk. II. As Influenced by the Utensils." *Bull. No. 204.* February 1918. Pp. 217-257. 1 Figure, 25 Tables.

SEEBERGER, X. "The Action of Extract of Infectious and Non-infectious Flesh on the Intestine" (Die Wirkung von Extrakten aus infiziertem und nicht infiziertem Fleisch auf den überlebenden Darm). Inaug. Diss. Zürich. 1918. Pp. 54. 56 Tracings.

INFECTIOUS DISEASES.

ALBERT, F. "Bacterial Association in Tetanus Infection" (L'association microbienne dans l'infection tétanique. Son importance en clinique). *C. R. Soc. Biol.* Vol. LXXXI., No. 20. 16th November 1918. Pp. 1056-1058.

In all severe cases of tetanus, very acute or subacute, and with a fatal termination, the author has always found the *B. coli* associated with the organism of tetanus.

BARDON, S. B. "Hæmorrhagic Septicæmia in Foals Shortly after Birth" (Consideraciones acerca de la patogenia de la septicemia hemorrágica). *Revista Hig. y Sanidad Pecuarias.* Vol. VIII., No. 9. September 1918. Pp. 581-582.

The writer of this note relates his experience of two foals in which hæmorrhagic septicæmia developed two hours after birth, and terminated fatally two hours later.

BAZY, L. "What the War has Taught us about Tetanus." *Lancet.* Vol. CXCV., No. 4964. 19th October 1918. Pp. 523-526.

As the result of repeated doses of antitetanic serum, the common tetanus, observed before the war, almost completely disappeared. In its place some cases of post-seric tetanus have been observed.

"In short, it may be said that the war has brought us the following ideas:—(1) Antitetanic preventive serotherapy is efficacious in the immense majority of cases. (2) When it acts incompletely it so modifies the course of tetanus that it has created new forms of the disease, unknown before its use was general. (3) The study of the checks to serotherapy ought to lead us (*a*) to use the serum in a more rational way; and (*b*) to know how to complete its action by that of an antitetanic vaccination."

BERTETTI, E., and FINZI, G. "Therapy of Glanders" (Relazione sugli studi fatti a Brian per la terapia della morva). *Il Nuovo Ercolani.* Vol. XXIII., No. 17. 15th September 1918. Pp. 209-219. *Ibid.* No. 18. 30th September 1918. Pp. 225-237.

CAPMAU. "Epizootic Lymphangitis" (Quelques observations sur la lymphangite épidémique. Méthode Velu et méthode Belin). *Rec. Méd. Vét.* Vol. XCIV., Nos. 16-18. 30th August-30th September 1918. *Bull. Soc. Centr. Méd. Vét.* Pp. 337-360.

CARPANO, M. "Bacteria Associated with the Cryptococcus in Epizootic Lymphangitis" (Le associazioni batteriche nelle infezioni da *Cryptococcus farciminosus* (Rivolta, 1873)). *Ann. d'Igiene.* Vol. XXVIII., No. 6. June 1918. Pp. 273-279.

CARPANO, M. "The Control of Infectious Disease in Latium" (Per la difesa contro le malattie infettive del bestiame nel Lazio). *La Clinica Vet.* Vol. XLI., Nos. 20-21. 31st October-15th November 1918. Pp. 555-565.

COSCO, G., and AGUZZI, A. "The Virulence of the Blood in Foot-and-Mouth Disease, and Attempts at Immunisation" (Sur la virulence du sang des bovidés aphéteux et essais d'immunisation contre la fièvre aphéuse). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 318. June 1918. Pp. 233-240.

FARRERAS, P. "The Eradication of Glanders" (La extinción del muermo). *Revista Vet. Espana.* Vol. XII., No. 6. June 1918. Pp. 247-259.

A summary of recent literature, with numerous references.

— "Diminution in the Weight and Volume of the Spinal Cord when kept in Glycerin" (La misminución del peso y del volumen de las médulas de conejo en la glicerina). *Rerista Vet. Espana.* Vol. XII., No. 7. July 1918. Pp. 299-300.

Observations on the material used in connection with rabies inoculations show that the spinal cord of the rabbit undergoes a rapid and considerable diminution in volume and weight during the first three or four days when preserved in glycerin. Afterwards there is no further diminution. In some observations, spinal cords, after three or four days in pure neutral glycerin, lost approximately a third of their weight.

FEERS, A. G. "Infectious Anemia of Horses." *Amer. Journ. Vet. Med.* Vol. XIII., No. 11. November 1918. Pp. 527-533. 10 Figures.

"Final Report of the Italian Commission on the Therapy of Glanders" (Relazione finale che la Commissione di Controllo per gli studi sulla terapia della Morva presentò a S. E. il Ministro della Guerra). *Il Nuovo Ercolani.* Vol. XXIII., No. 21. 15th November 1918. Pp. 259-266.

GRAHAM, R. "Necrobacillosis in Swine." *Circular No. 222.* Univ. Illinois Agric. Exp. Station. June 1918. Pp. 12. 7 Figures.

HAGAN, W. A. "The Etiology and Mode of Infection in White Scours of Calves." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 140-161. 2 Tables.

For an abstract of this paper from another source, see this *Review*, 1918, II. 170.

JENSEN, H. "Hemorrhagic Septicemia, its Clinical Diagnosis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 39-47.

Contains sections dealing with the disease in its pulmonary, subcutaneous, cutaneous, and enteric forms, as it occurs in sheep and pigs, and its differential diagnosis.

LATOUR, P. "Treatment of Epizootic Lymphangitis" (Note sur le traitement de la lymphangite épizootique par le serum de cheval guéri). *Bull. Acad. Med.* Vol. LXXX., No. 30. 30th July 1918. Pp. 141-143.

LOUIS, A., and LECOMPTÉ, D. "The Intradermal Palpebral Mallein Test" (Observations relatives à l'intra-dermo-malléination palpébrale comme méthode de diagnostic de la morve). *Rev. Gén. Méd. Vét.* Vol. XXVII, No. 320. August 1918. Pp. 361-368.

MORI, N. "Experimental Prevention and Cure of Exudative Pleuro-Pneumonia of Goats by Means of a Special Serum" (Di un esperimento ufficiale di prevenzione e di cura della pleuropolmonite essudativa delle capre mediante un particolare siero ricavato dall'essudato pleurico specifico). *Il Moderno Zooiatro.* Parte Sci., Ser. V. Vol VII., No. 9. September 1918. Pp. 193-200.

PEGGIE, W. W. "Observations on Joint-Ill Prophylaxis." *Vet. Record.* Vol. XXXI., No. 1584. 16th November 1918. Pp. 164-165.

Sixty in-foal mares were treated with a polyvalent antistreptococcic serum, "and during the whole season not a single case of joint-ill was observed in the foals of the injected mares. Seventeen of those mares had foals showing joint-ill on one or other of the two previous seasons." A fact which appears to the writer to be very significant was "that every mare carried her foal a fortnight, and in many cases three weeks, past her actual foaling period. The foals were born strong, with a thick coating of hair, and in most cases the umbilical cord ruptured naturally and did not require to be ligatured."

PÉRUSSET. "Contagious Agalaxy of Goats and Sheep" (Contribution à l'étude de l'agalactie contagieuse des chèvres et des moutons). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 403-412. 12 Figures.

SLAWSON, A. "Serum or Inula and Echinacea in the Treatment of Canine Distemper." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 766-767.

"Anti-canine distemper serum is injected subcutaneously, three injections of 4 to 7 c.c. being the rule. . . . It may be stated that subcutaneous

injections of this serum cause little pain, no œdema, and no lameness. . . . Inula and echinacea, a proprietary compound composed of *Echinacea angustifolia* and *Inula helenium*, is injected intramuscularly, six injections of from 2 to 5 c.c. being the usual number. This injection causes pain, lameness for a day or two, and often a transitory cellulitis or serous infiltration with its consequent pain and swelling."

STAZZI, P. "Infection of New-Born Calves and Sero-Prophylaxis" (Le infezioni di stalla dei vitelli neonati e la loro siero-profilassi). *La Clinica Vet.* Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 414-425.

STECK, W. "The Presence of *B. abortus* (Bang) in the Milk of Healthy Cows" (Über das Vorkommen des *Bacterium abortus* infektiöse Bang in der Milch gesunder Kühe). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 11. November 1918. Pp. 547-551.

STOCKMAN, S. "Louping-Ill." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 3. September 1918. Pp. 137-193. 10 Figures.

THEILER, A. "Contagious Abortion in Cattle." *Rhodesia Agric. Journ.* Vol. XV., No. 3. June 1918. Pp. 268-278.

"The investigations into contagious abortion are practically only of recent date; we only begin to see our way in this complex problem, and if results will be obtained at the same rate as they have been forthcoming hitherto, the clearing up of many unsettled points may be looked for at a not far distant future."

VAN SACHEM, R. "The Treatment of Ulcerative Lymphangitis" (Traitement de la lymphangite ulcéruse). *Bull. Soc. Path. Exot.* Vol. XI., No. 8. October 1918. Pp. 683-685.

WILLIAMS, W. L. "Diseases Interfering with Reproduction in Cattle and their Significance to the State." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 697-710.

WILLIAMS, W. L., and HAGAN, W. A. "Researches in the Diseases of Breeding Cattle." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 62-119.

MEDICINE.

AUGUSTIN. "Abnormal Ratio of Chloride of Sodium in the Serum of the Horse in Disease" (Recherches sur les taux anormaux de chlorure de sodium dans le sérum du cheval malade). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 321. September 1918. Pp. 425-433.

BARRAT, E. "The Causes of Laminitis and Non-Traumatic 'Corn'" (Des causes de la fourbure et de la bleime non traumatique). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 321. September 1918. Pp. 433-438.

BOLTON, R. R. "The Examination of the Eye." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 22-29.

A general consideration of methods employed in the examination of the eye.

BULL, L. B. "Rickets in Foxhound Puppies: A Clinical and Experimental Investigation." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 3. September 1918. Pp. 193-214.

CAZALBOU, L. "Judging the 'Condition' of a Horse" (L'appreciation de l'état d'entretien du cheval). *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 24th October 1918. Pp. 437-440. 1 Figure.

The author views the croup of the horse from behind, the animal standing firmly on the hind limbs. He decides the condition of the horse by noting whether the line of the croup curves above or sinks below a straight line joining the upper part of the angle of the ilium (coxal tuber) with the summit of the sacrum.

CLARK, W. L. "The Violet Ray in Veterinary Medicine." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 774-777.

The writer states that he has obtained good results from the high frequency electrical treatment of cases of paresis and azoturia.

FROST, J. N. "Formalin in the Treatment of Mastitis." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 162-165.

A brief note on the author's method of treating mastitis caused by infection has been given previously in this *Review* (1917, I. 332). He administers formalin undiluted in a capsule; but it may be given in milk or oil.

[Bosshart (*Journ. Amer. Vet. Med. Assoc.*, 1917, li. 831; see this *Review*, 1918, II. 115) has also reported favourably on this method of treatment, but recommends smaller doses than are given by Frost.]

GUPTA, M. C. "Lymphangitis in Elephants." *Vet. Journ.* Vol. LXXIV., No. 11. November 1918. Pp. 403-409. 2 Figures.

The object of this note is to direct the attention of the veterinary profession, both in India and elsewhere, to this disease, in order that it may be further investigated.

HAYES, F. M. "Hogs and the Tent Caterpillar." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 59-61. 4 Figures.

POLLOCK, J. W. "Notes on Mastitis in Cattle." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. P. 376.

The disease "is very common during the months of July and August, and rare during the remainder of the year, and during these months heifers which have not calved are as liable to get the disease as are dairy cows. . . . The formation of abscesses in these summer cases is rare. Even in the milder cases the milk secretion is never restored in the diseased quarters of the udder for the same season. . . . On the other hand, in those infrequent cases occurring in the other months of the year, the restoration of the milk secretion to the diseased quarter is the rule, even in the same season, although in diminished quantity; these cases are not usually septic. It will be observed that the summer cases appear with the advent of the fly-season and disappear with the departure of the flies."

STRODE, C. W. "Purpura Hemorrhagica at an Army Remount." *Amer. Journ. Vet. Med.* Vol. VIII., No. 9. September 1918. Pp. 446-448.

WILSON, P. "Retention of Urine as a Cause of Colic in Young Foals." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 333-334.

METHODS.

CARAGEORGIADES, H. "Two Neutral Panoptic Stains" (Deux colorants neutres pour la méthode panoptique, de préparation facile et rapide). *C. R. Soc. Biol.* Vol. LXXXI., No. 18. 26th October 1918. Pp. 925-928.

Two modified Romanowsky stains, claimed to be rapidly and easily prepared in any laboratory, even where resources are restricted, and giving constant results with great fineness of detail.

DAVIS, J. D. "Food Accessory Factors (Vitamins) in Bacterial Culture. II." *Journ. Inf. Dis.* Vol. XXIII., No. 3. September 1918. Pp. 248-251.

In sprouted grain (rice and wheat) media, bacteria grew more rapidly and profusely.

HALL, I. W., CAMPBELL, A., and HILES, I. "On the Amino-Acid Content of Nutrient Media." *Brit. Med. Journ.* No. 3015. 12th October 1918. Pp. 398-401. 5 Tables.

The writers submit considerations in support of a proposal for the general adoption of a uniform amino-acid content for nutrient media. "We are aware that the proposition does not envisage any standardisation of the vitamine fraction. The addition of vitamines is rather an art than a science

at present, and fortunately it is less necessary when the amino acids are in excess. We may also deplore that it does not attempt to construct a medium which reproduces the physical changes which occur in infected tissue, or take into account the action of the secondary products of bacterial action. . . . Nevertheless, working always with a standard measure of nutriment, we may obtain more concordance in our cultures and perhaps gain a broader insight into the mutations of bacterial action during latent and active infections."

HUNTOON, F. M. "'Hormone' Medium. A Simple Medium Employable as a Substitute for Serum Medium." *Journ. Inf. Dis.* Vol. XXIII., No. 2. August 1918. Pp. 169-172.

"The advantages of medium so prepared are: Simplicity of preparation technic; great increase in growth efficiency; prolonged life of stock cultures, and convenience in the preparation of bacterial antigens, there being no serum element to be taken into consideration."

JABLONS, B., and PEASE, M. "Preliminary Communication on the Use of a Simple Medium for the Early Identification of Streptococci and Certain Anaerobic Bacteria in Wounds." *C. R. Soc. Biol.* Vol. LXXXI., No. 21. 23rd November 1918. Pp. 1072-1076.

"This medium consists of peptone water which has been alkalinised to a minus 2 reaction to phenolphthalein to which a small amount of beef, rabbit, or human liver has been added. The liver peptone water is prepared as follows:—Add peptone, 10 grammes, and sodium chloride, 5 grammes, to (distilled) water, 1000 c.c. Dissolve by boiling thirty minutes Neutralise to phenolphthalein, then add 20 c.c. of normal sodium hydrate solution; autoclave for fifteen minutes at 115° C.; filter; tube (placing 10 c.c. in each tube), and add approximately 1 gramme of rabbit, beef, or human liver. Autoclave for fifteen minutes at 115° C.; incubate for three days to insure sterility (if sterile, the fluid will remain clear—it may assume a faint yellow colour)."

JONESCO-MIHAIESTI, C. "Methods of Staining Blood and Protozoa" (Nouvelle formule d'une solution panchromatique pour la coloration du sang et des protozoaires). *C. R. Soc. Biol.* Vol. LXXXI., No. 21. 23rd November 1918. Pp. 1088-1090. (Technique de la coloration du sang et des protozoaires par le mélange panchromatique de bleu éosine.) *Ibid.* Pp. 1090-1092.

KOSER, S. A. "The Employment of Uric Acid Synthetic Medium for the Differentiation of *B. coli* and *B. aerogenes*." *Journ. Inf. Dis.* Vol. XXIII., No. 4. October 1918. Pp. 377-379. 1 Table.

MANOUÉLIAN, Y. "Rapid Method of Impregnation of Spirochaetes in Sections" (Technique rapide pour l'imprégnation des organismes spiralisés dans les coupes). *C. R. Soc. Biol.* Vol. LXXXI., No. 14. 20th July 1918. Pp. 759-760.

MAWAS, J. "The Use of Bromin in the Depigmentation of Microscopic Sections" (De l'emploi du brome pour la dépigmentation des coupes histologiques). *C. R. Soc. Biol.* Vol. LXXXI., No. 14. 20th July 1918. Pp. 767-769.

For the decolorisation of pigmented tumours, etc., the author uses twenty drops of bromin in 100 c.c. of water. The decolorisation of the pigment is complete at the end of twelve to twenty-four hours. The sections are then washed in slightly alkaline water, then in ordinary water. The usual stains can then be used, and microchemical reactions are not affected.

REYNOLDS, F. H., and SCHOENING, H. W. "An Improved Method for Recovering Trypanosomes from the Blood of Rats for Antigen Purposes in Connection with Complement Fixation." *Journ. Agric. Res.* Vol. XIV., No. 13. 23rd September 1918. Pp. 573-576.

WILSON, W. J., and STEER, P. "Points in the Technique Employed in the Isolation and Cultivation of Anaerobic Bacteria." *Brit. Med. Journ.* No. 3021. 23rd November 1918. Pp. 568-569. 2 Figures.

WURTZ, J. G., and SAPPINGTON, S. W. "A Simple Method for Blood Cultures." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 371-378.

"The patient's blood diluted in a test-tube of sterile water makes an excellent culture medium for a number of infections, at the same time furnishing the infecting organism. . . . We do not feel sure of the optimum dilution of blood for this work, but would suggest 30 to 40 per cent. if only one tube is made, and a 5 to 10 per cent. and a 40 per cent. tube if two are taken. It is important to insure sterility of the water."

OBSTETRICS.

BURKI, F. "Manipulation of the Ovary" (Die manuelle Behandlung der Ovarien). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 10. October 1918. Pp. 477-483.

KRUPSKI, A. "Recent Advances in the Physiology and Pathology of the Reproductive Organs" (Vergleichende Betrachtungen über neuere Forschungs-Ergebnisse auf dem Gebiete der Sexual-Physiologie und Pathologie). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 9. September 1918. Pp. 413-428.

An essay-summary with numerous references to recent literature.

WILSON, P. "A Case of Combined Maternal and Foetal Dystokia." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 329-330.

The writer of this note explains the production of the dystokia in the

following manner :—"The foot of the foal would have got caught in a slight fold of the uterine wall, and become fixed there. With each contraction of the uterus the fold became deeper owing to the pressure of the foot, and the foot got into a longer pocket, until the pocket became co-extensive with the length of the leg, and the foot reached a position just inside the vulva. The head had followed this leg."

PARASITOLOGY

(Including Entomology and Protozoology).

BARDELLI, P. "Equine Sarcoptic Mange in Army Animals" (La rognia sarcoptica negli equini militari). *La Clinica Vet.* Vol. XLI., Nos. 20-21. 31st October-15th November 1918. Pp. 524-555.

A general survey of the disease, with a *résumé* of recently suggested methods of treatment.

BOUET. "Equine Parasitic Mange" (Sur la gale du cheval (tonte, coupe des crinières et queues)). *Rev. Path. Comp.* Vol. XVIII., No. 149. October 1918. Pp. 4 (192)-7 (195).

CAZALBOU, L. "A Practical Means of Diagnosis in Parasitic Mange" (Un moyen pratique de diagnostic dans la gale des équidés). *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 10th October 1918. Pp. 403-404.

CLAYTON, T. A. "The Treatment of Mange with Sulphurous Anhydride" (Le traitement de la gale par les gaz sulfureux avec quelques renseignements d'ordre général sur les acarès, agents pathogènes de la gale des équidés, et sur les propriétés des diverses formes des gaz sulfureux). *Bull. Soc. Méd. Vét. Pratique.* Vol. II., No. 8. October 1918. Pp. 227-236.

COMINOTTI, L., and DI DOMIZIO, G. "The Bovine Hæmoglobinuria of pre-Alpine Regions is a Piroplasmosis" (L'emoglobinuria dei bovini delle region prealpine è una piroplasmosi). *La Clinica Vet.* Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 425-430.

DEDERICK, F. V. "A Survey of the Intestinal Parasites of the Dog." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 199-200.

In the examination of 150 dogs, taken indiscriminately and all from the vicinity of Ithaca, New York, ninety-eight were found to be infested with intestinal parasites. Of these forty-six harboured *Ankylostomum*

trigonocephalum, thirty-five *Ascaris marginata*, and seventeen *Tricocephalus depressiusculus*. The table does not indicate the number of animals infested by more than one variety of parasite.

DEMORA, C. "Treatment of Mange by Sulphuration" (Guérison de la gale par les gaz sulfureux). *Bull. Soc. Méd. Vét. Pratique*. Vol. II., No. 9. November 1918. Pp. 268-288.

DI DOMIZIO, G. "Trypanosomiasis of the Dromedary in Eritrea" (Una tripanosomiasi del dromedario eritreo (*Gudhù*). Cenni sulle mosche ematofage dell'Colonia Eritrea). *La Clinica Vet.* Vol. XLI., Nos. 16-17. 31st August-15th September 1918. Pp. 391-413. 1 Plate (11 Figures), 3 Text-Figures.

DODD, S. "Some Observations on the Internal Parasites of Live Stock." *Agric. Gaz., N. S. W.* Vol. XXIX., No. 7. July 1918. Pp. 497-507.

"Dressing for Mange in Horses, Suggested by the Veterinary Department of the Board of Agriculture and Fisheries." *Journ. Board Agric.* Vol. XXV., No. 8. November 1918. P. 976.

FITCH, C. P. "Parasites Affecting Sheep." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 341-359. 4 Plates.

FRANC. "Prophylaxis and Treatment of Parasitic Mange" (La gale au front. Sa prophylaxie. Son traitement). *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 24th October 1918. Pp. 440-446.

GALLI-VALERIO, B., and STALDER, H. "Bovine Piroplasmosis in Switzerland" (La piroplasmose des bovidés en Suisse). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 10. October 1918. Pp. 471-477. 1 Figure.

GUÉRIN, A. "Treatment of Parasitic Mange in Horses" (Traitement idéal des chevaux galeux). *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 511-512.

HALL, M. C., and WIGDOR, M. "A *Physaloptera* from the Dog, with a Note on the Nematode Parasites of the Dog in North America." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 733-744. 6 Figures.

In a series of over 300 dogs examined post-mortem at Detroit the authors found a single female specimen of *Physaloptera* in one dog. They describe the parasite as a new species—*Physaloptera rara*.

HALL, M. C., WILSON, R. H., and WIGDOR, M. "The Anthelmintic Treatment of Equine Intestinal Strongylidosis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 47-55. "Some Notes on the Treatment of Equine Ascariasis and Oxyuriasis." *Ibid.* Pp. 56-57.

H. R. "Treatment of Equine Mange by Sabadilla" (*Traitemenit de la gale des équidés par la cévadille*). *Bull. Soc. Mél. Vét. Pratique.* Vol. II., No. 9. November 1918. P. 289.

JACK, R. W. "Tsetse Fly in Southern Rhodesia, 1918." *Rhodesia Agric. Journ.* Vol. XV., No. 5. October 1918. Pp. 406-415. 2 Plates (7 Figures).

A popular account. Interest in the "fly" question has lately become very acute in certain parts of the territory. The article is accompanied by a map on which are indicated the six fly belts of Southern Rhodesia.

LEIPER, R. T. "Is the Cat really a Definitive Host of *Dicrocoelium lanceatum*? A Note on Some Flukes from British Guiana and the Malay States." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 327-329.

The author prefers to accept the view that (a) the sheep fluke does not use the cat as an alternative definitive host; (b) the flukes found by Bodkin and Wellington probably belong to a distinct species of an allied genus, namely, *Platynosomum*; and (c) the early record of V. Siebold, etc., of the occurrence of *Dicrocoelium lanceatum* in the cat remains still an isolated, doubtful, and unconfirmed statement.

LENTZ, W. J. "Intestinal Coccidiosis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 155-156.

Reports satisfactory results from the following treatment of bovine intestinal coccidiosis ("red dysentery") :—"Pearson's creolin well diluted with milk or water, also large doses of camphorated tincture of opium, and rectal injections, using garden hose and funnel, of a 2 per cent. creolin solution, alternating night and morning with a 1 per cent. alum solution."

PANNISET, M. L. "The Treatment of Parasitic Mange" (*Le traitement de la gale du cheval. Les méthodes adoptées durant la guerre*). *La Vie Agric. et Rur.* Vol. VIII., No. 28. 13th July 1918. Pp. 31-34. 2 Figures.

PRICOLO, A., and FERRARO, G. "Trypanosomiasis of the Camel in Eritrea" (*Circa il tripanosoma del cammello della Colonia Eritrea*). *La Clinica Vet.* Vol. XLI., Nos. 20-21. 31st October-15th November 1918. Pp. 522-524.

- ROSSIGNOL, H. "The Treatment of Mange with Sulphurous Anhydride" (*Compte-Rendu des expériences des 10 et 28 Septembre 1918 sur l'emploi des gaz sulfureux dans le traitement de la gale (Méthode Clayton)*). *Bull. Soc. Méd. Vét. Pratique.* Vol. II., No. 8. October 1918. Pp. 209-219. 2 Figures.
- ROUSSEAU, L. "Parasitic Diseases at Douala (Cameroon)" (*Maladies parasitaires à Douala (Cameroun)*). *Bull. Soc. Path. Exot.* Vol. XI., No. 8. October 1918. Pp. 744-759.
Reports trypanosomiasis as occurring in native cattle and a horse. Ten dogs were examined, but trypanosomes were not found.
- SALM, A. J. "Two Nematodes of Java" (*Deux nématodes de Java*). *Bull. Soc. Path. Exot.* Vol. XI., No. 8. October 1918. Pp. 705-710. 2 Figures.
- SCHULTZ, C. H. "Mysterious Losses among Cattle in the Pacific Northwest." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 711-732.
"After many observations and as careful a study as circumstances would permit, I diagnosed what is commonly known as 'red dysentery' of cattle as the cause of a great part of these losses."
- SCOTTI, G. B. "The Treatment of Equine Sarcoptic Mange" (*Alcune osservazioni sulla cura della rogna sarcoptica negli equini*). *La Clinica Vet.* Vol. XLI., No. 19. 15th October 1918. Pp. 498-510.
- SHIMURA, S. "A New Non-Pathogenic Tetragenous Ameba. I." *Journ. Ecp. Med.* Vol. XXVIII., No. 4. October 1918. Pp. 415-428. 2 Plates (42 Figures).
- TORTI, E. "The Cure of Mange" (*Contributo allo studio della cura della rogna*). *Il Nuovo Ercolani.* Vol. XXIII., Nos. 19-20. 15th-31st October 1918. Pp. 241-250.
- URBAIN. "Cyclicostomo-Strongylosis of the Horse" (*Le marasme des chevaux de troupe*). *Ier. Gén. Méd. Vét.* Vol. XXVII., No. 318. June 1918. Pp. 240-246.
- VAN SACEGHEM. "Contribution to the Study of *Gastroliscus aegyptiacus*" (*Contribution à l'étude du Gastroliscus aegyptiacus (Cobbold, 1876)*). *Bull. Soc. Path. Exot.* Vol. XI., No. 5. May 1918. Pp. 396-397.
- VELU, H. "Equine Trypanosomiasis in Morocco" (*Une trypanosomiase du cheval au Maroc. Étude clinique et expérimentale*). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 322. October 1918. Pp. 489-513.

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YAKIMOFF, W. L., and Others. "Trypanosomiasis of Camels in Russian Turkestan." *Parasitology*. Vol. XI., No. 1. November 1918. Pp. 35-80. 29 Tables, 3 Plates (20 Figures).

YORKE, W., and MACFIE, J. W. S. "Strongylidae in Horses. IV. *Gyalocephalus capitatus* Looss." *Ann. Trop. Med. and Parasitol.* Vol. XII., No. 1. July 1918. Pp. 79-90. 9 Figures. "*V. Gyalocephalus equi*, sp. n." *Ibid.* Pp. 91-92. 3 Figures.

PATHOLOGY AND BACTERIOLOGY.

BESSON, A., RANQUE, A., and SENEZ, C. "Variation in the Reduction of Neutral Red by Micro-Organisms" (Variations dans la réduction du rouge-neutre par les microbes ; utilisation pour le diagnostic). *C. R. Soc. Biol.* Vol. LXXXI., No. 18. 26th October 1918. Pp. 928-930.

— "Biochemical Action of Micro-Organisms on Sugars and Alcohols" (Action biochimique des microbes sur les sucres et les alcools). *C. R. Soc. Biol.* Vol. LXXXI., No. 18. 26th October 1918. Pp. 930-933.

DUBLIN, H. "Studies of Urobilin Elimination in the Normal and Anæmic Dog." *Journ. Exp. Med.* Vol. XXVIII., No. 3. September 1918. Pp. 313-318. 4 Tables.

"The output of urobilin is increased in experimental trypanosome anæmia presumably as a result of the increased blood destruction. The administration of salvarsan (arsenobenzol) during the anæmic period, if it checks the blood destruction, reduces the urobilin elimination, but this result does not follow unless the blood-picture improves. Following splenectomy in the normal dog an increase in the urobilin elimination of varying degree occurs, the significance of which is doubtful. Splenectomy during the period of anæmia does not cause a decrease in urobilin elimination."

EVANS, ALICE C. "Further Studies on *Bacterium abortus* and Related Bacteria. III. *Bacterium abortus* and Related Bacteria in Cow's Milk." *Journ. Inf. Dis.* Vol. XXIII., No. 4. October 1918. Pp. 354-372. 5 Tables.

— "A Streptothrix (*Nocardia*) Infection of Cows' Udders." *Journ. Inf. Dis.* Vol. XXIII., No. 4. October 1918. Pp. 373-376.

GAY, F. P. "Recent Aspects of Streptococcus Infection." *Journ. Lab. and Clin. Med.* Vol. III., No. 12. September 1918. Pp. 721-757. 2 Tables.

"An attempt is made in this review to collect and correlate the extensive literature, the bulk of which is American in origin, on this subject that has

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appeared in recent years." It is manifestly impossible to adequately abstract a paper of this nature: it must be consulted in the original. In the author's opinion "the most satisfactory classification of streptococci is that of Holman ('The Classification of Streptococci,' *Journ. Med. Res.*, 1916, xxxiv. 377), which consists in a primary differentiation of haemolytic and non-haemolytic strains by the superficial streak method on blood agar followed by classification of three sugars—lactose, mannite, and salicin." "There is very little evidence in human or animal pathology which would lead us to suppose that recovery from streptococcus infection leads to any considerable or durable degree of acquired immunity." The paper is accompanied by a very extensive bibliography.

GOLDBERG, S. A. "The Pathology of Spavin." *Report N. Y. State Vet. Coll.*, 1916-17. 1918. Pp. 255-340. 7 Plates (18 Figures).

The substance of this paper has already appeared in *Cornell Veterinarian* (1918, viii. 107-119), and *Journ. Med. Res.* (1918, xxxviii. 225-265) (see this *Review*, 1918, II. 324 and 535).

— "Certain Aspects of the Pathology of Spavin." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 136-139.

GROSS, I. "Studies on the Circulation of the Kidney in Relation to Architecture and Function of the Organ in Health and Disease. Chronic Productive (Indurative) Nephritis." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 379-384. 1 Plate (2 Figures).

"We find in contracted kidney a marked change from the normal in parenchymatous and vascular arrangement. The cortex is largely eliminated and has become passive, whereas the pyramids are preserved and better vascularised, possibly to take on a more active participation in the work in the kidney than in the normal physiological sphere. This means renal insufficiency and perversity."

JONES, F. S. "Studies in Bovine Mastitis. II. The Relation of Hemolytic Streptococci to Udder Infections." *Journ. Exp. Med.* Vol. XXVIII., No. 3. September 1918. Pp. 253-267. 3 Tables.

LACROIX, J. V. "Fibroma in Dogs." *Amer. Journ. Vet. Med.* Vol. XIII., No. 11. November 1918. Pp. 562-563. 2 Figures.

"For some reason, dogs are rather susceptible to fibromata. Since the growths are not confined to any particular part of the body, the condition cannot be ascribed to any particular cause. Every practitioner who has handled many surgical canine cases has encountered many cases where large fibrous tumours involve the maxillary region, the inferior cervical region, the axillary region, and the region of the perineum."

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LUDEN, G. "The Blood Cholesterol in Malignant Disease and the Effect of Radium on the Blood Cholesterol." *Journ. Lab. and Clin. Med.* Vol. IV., No. 1. October 1918. Pp. 849-864. 11 Figures, 4 Tables.

"The high cholesterol values commonly found in carcinoma are not due to cell destruction, since they are reduced by radium treatment, although radium causes cell destruction; they must therefore be due to a disturbance of cholesterol metabolism."

M'CARTY, W. C. "Cancer's Place in General Biology." *Amer. Nat.* Vol. LII., Nos. 620-621. August-September 1918. Pp. 395-408. 7 Figures.

MACNIDER, W. DE B. "The Stability of the Acid-Base Equilibrium of the Blood in Naturally Nephropathic Animals and the Effect on Renal Function of Changes in this Equilibrium. I. A Study of the Acid-Base Equilibrium of the Blood in Naturally Nephropathic Animals and of the Functional Capacity of the Kidneys in such Animals following an Anæsthetic." *Journ. Exp. Med.* Vol. XXVIII., No. 4. October 1918. Pp. 501-516. 2 Plates (2 Figures), 2 Tables. "II. A Study of the Efficiency of an Alkali to Protect the Naturally Nephropathic Kidney against the Toxic Effect of an Anæsthetic." *Ibid.* Pp. 517-528. 3 Plates (3 Figures), 2 Tables.

OERTEL, H. "Degeneration, Senescence, and New Growth." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 485-493.

"The idea of endless proliferation as the result of cell degeneration is not idle speculation, but rests upon an anatomical and experimental basis. . . The very recent observations by Goodpasture in an anatomical study of senescence in dogs (see this *Review*, 1918, II. 476) has brought corroboration in *optima forma*, for they led him to the conclusion that 'senescence in dogs is accompanied by multiple degenerative changes in many organs and tissues, and associated with these changes are multiple benign and malignant tumours, which seem to result from these degenerative changes.'"

SMITH, T. "A Pleomorphic Bacillus from Pneumonic Lungs of Calves Simulating Actinomyces." *Journ. Exp. Med.* Vol. XXVIII., No. 3. September 1918. Pp. 333-344. 4 Plates (10 Figures).

PHARMACOLOGY AND THERAPEUTICS.

ARCHIBALD, R. A. "Organotherapy and the Classification of Therapeutic Tissue Extracts." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 33-39.

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BALLS, A. K., and MORAL, J. D. "The Action of Certain Antiseptics, Toxic Salts, and Alkaloids on the Bacteria and Protozoa of the Intestine of the Rabbit." *Journ. Inf. Dis.* Vol. XXIII., No. 4. October 1918. Pp. 382-391. 4 Tables.

"In the intestinal content of the rabbit it is possible to show that resistance of *Giardia cuniculi* against the action of certain antiseptic substances is markedly greater than the resistance of the intestinal bacteria. It is possible, by making use of this difference in resistance, to obtain *Giardia* free from all living bacteria, but attempts to subsequently grow them in pure culture have not succeeded. *Giardia* are more resistant to the action of the toxic substances studied than are the free living protozoa studied. A technical method has been developed which we believe will be useful in demonstrating the applicability of intestinal antiseptics against both the protozoa and the bacteria of the intestine."

BELIN. "The Pharmacodynamics of Alkaline Chlorates" (Au sujet de la pharmacodynamie des chlorates alcalins). *C. R. Soc. Biol.* Vol. LXXXI., No. 16. 12th October 1918. Pp. 817-818.

It is suggested that the leucocytolysis following the intravenous or subcutaneous injection of alkaline chlorates sets free oxydases, and that these can act (in "oxido-therapy") in the same manner as permanganate of potassium and other oxidising substances.

BRUNELLI, A. "The Utility of Solidified Alcohol in War" (Utile impiego dell' alcool solidificato in guerra). *Il Nuovo Ercolani.* Vol. XXIII., No. 21. 15th November 1918. Pp. 268-269.

D'HERELLE, F. "Experimental Bacteriotherapy" (Essais de bactériothérapie expérimentale). *C. R. Soc. Biol.* Vol. LXXXI., No. 18. 26th October 1918. Pp. 937-939.

Mice were caused to ingest culture of *Bacillus typhi murium*, and were afterwards inoculated with an emulsion of the bacilli, derived from a twenty-four-hour culture, killed by essence of mustard. The mice which were inoculated twenty-four and forty-eight hours after infection showed a considerable resistance.

The author thinks that bacteriotherapy may form an efficacious method of treatment in infectious conditions.

DESMOIRES. "Algine" (L'algine). *Rev. Path. Comp.* Vol. XVIII., No. 148. August-September 1918. Pp. 1 (177)-4 (180).

Algine is a weak organic acid which is found in large amount in certain marine algæ, the laminaria, for example. It is a valuable food, and may be used in pharmacy to emulsify oils and as an excipient in pills.

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FABRETTI. "Is Apomorphine an Emetic for Pigs?" (L'apomorfina è o non è un vomitivo per i maiali?) *Il Moderno Zooiatro.* Parte Sci., Ser. V. Vol. VII., No. 9. September 1918. Pp. 202-203.

From the results of experiment, Brusasco and Tabusso (*Prattato teorico-pratico di Materia Medica e Terapeutica Veterinaria*) conclude that apomorphin does not produce emesis in the pig, whatever the manner in which it is administered. The writer of the present note, however, administered apomorphin to a sow, and vomiting resulted.

FRIEDMAN, G. A. "The Experimental Production of Lesions, Erosions, and Acute Ulcers in Rabbits, by the Repeated Injections of Pilocarpin and Adrenalin." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 449-463.

Lesions of the mucosa of the stomach and duodenum were produced.

FRIEZ, F. "The Utilisation of Coffee Grounds" (De l'utilisation des "marcs de café" en campagne). *Rev. Gén. Méd. Vet.* Vol. XXVII., No. 320. August 1918. Pp. 368-371.

The abundance of coffee grounds in the Army led to a consideration of the possibility of their utilisation. Given to healthy horses they have stimulating, diuretic, and laxative effects. The grounds are given in the morning to the amount of 1 kilogramme per horse, and may be mixed with the food. For preference they are mixed with a thin bran mash. The value of coffee grounds in pleurisy, pneumonia, hæmoglobinæmia, debility, and "founder" is illustrated by short accounts of cases.

GREENWALD, I. "Observations on the Effect of Intravenous Injections of some Sodium Salts with Special Reference to the Supposed Toxicity of Sodium Phosphate." *Journ. Pharmacol. and Exp. Therap.* Vol. XI, No. 4. May 1918. Pp. 281-301. 4 Tables.

The observations were made on dogs. There was "a great difference in the permeability of the kidneys to the different salts, the sulphate and chloride being excreted in much larger amount than the phosphate."

GREY, E. G. "Dakin's Solution and Dakin's Oil in the Normal Peritoneal Cavity of the Dog." *Bull. Johns Hopkin's Hosp.* Vol. XXIX., No. 332. October 1918. Pp. 221-223.

HANZLIK, P. J. "The Effects of Various Agents on Superficial Hemorrhage and the Efficiency of Local Hemostatics." *Journ. Pharmacol. and Exp. Therap.* Vol. XII., No. 2. September 1918. Pp. 71-117. 3 Tables, 2 Charts.

— "The Effects of Various Systemic Agents on Superficial Hemorrhage." *Journ. Pharmacol. and Exp. Therap.* Vol. XII., No. 2. September 1918. Pp. 119-128. 2 Tables, 1 Chart.

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HUBER, H. L. "The Pharmacology and Toxicity of Copper Salts of Amino Acids. Studies on the Biochemistry and Chemotherapy of Tuberculosis XVI." *Journ. Pharmacol. and Exp. Therap.* Vol. XI., No. 4. May 1918. Pp. 303-329. 12 Tables.

The livers of newly born guinea-pigs from mothers on a diet containing copper "contained almost the same proportion of copper that the mothers' liver contained, while the remainder of the body contained only a trace of copper. This shows definitely, as has been pointed out by others, that copper passes through the placenta The deposition of copper (when introduced by feeding) in the liver and kidney and the lack of gross and microscopic changes in the tissues examined, simulate the findings in those experiments where the copper was introduced subcutaneously or intramuscularly."

KIRBY, F. "Active Principle Therapy." *Amer. Journ. Vet. Med.* Vol. XIII., No. 4. April 1918. Pp. 177-178. *Ibid.* No. 7. July 1918. Pp. 331-333.

LANG, W. W. "Further Observations on Sodium Chloride." *Vet. News.* Vol. XV., No. 771. 12th October 1918. Pp. 354-357. *Vet. Record.* Vol. XXXI, No. 1583. 9th November 1918. Pp. 153-155.

Six months' further investigation confirms the favourable results of medication with common salt previously published (see this *Review*, 1918, II. 396). "The saline treatment appears to be quite satisfactory in catarrh, strangles, all wounds, cellulitis, suppurative lymphangitis, tetanus and biliary fever." "Half a pound of salt appears to be a sufficient dose for all practical purposes."

LAPICQUE, M. "The Action of Chloralase and Chloroform on the Excitability of the Medulla" (Analyse de l'action du chloralase et du chloroforme sur l'excitabilité de la moelle). *C. R. Soc. Biol.* Vol. LXXXI, No. 14. 20th July 1918. Pp. 749-751.

Using decerebrated frogs, the writer found that while chloroform lowers reflex excitability, chloralase increases it. This difference of action may have a practical interest.

WILD, R. B. "The Pharmacology of Alcohol." *Lancet.* Vol. CXCIV., No. 4967. 9th November 1918. Pp. 623-625.

There is no proof of any direct stimulating action of pure ethyl alcohol upon the functions of the body after absorption. In experiments upon animals the action of the potable spirits is essentially that of ethyl alcohol and proportional to their alcoholic content.

PHYSIOLOGY.

DÄTWYLER, W. "On the Movements of the Spermatozoa of the Domestic Animals" (*Ueber die Bewegung der Spermatozoen der Haustiere*). Inaug. Diss. Zürich. 1918. Pp. 67. 6 Charts, 1 Figure.

GUILIANI, R. "The Influence of Mammary Nucleo-Protein on the Secretion of Milk in the Cow" (*Richerche sull'influenza del nucleoproteide di mammella sulla secrezione lattea delle vacche*). *La Clinica Vet.* Vol. XLI., No. 18. 30th September 1918. Pp. 463-477.

HAYDEN, C. E. "Orokinase and Ptyalin in the Saliva of the Horse." *Report N. Y. State Vet. Coll.*, 1916-17. 1918. Pp. 214-234. 13 Tables.

"Two drops of mixed mouth saliva from the horse diluted 1-10 does not activate parotid fistula saliva from that animal. It does not show any appreciable digestive power when used alone in that dilution. The filtrate from a solution of ground corn or oats contains a reducing sugar. The quantity of sugar does not show an average increase when the grains are digested with either mixed or parotid fistula saliva from the horse. Mixed human saliva does digest them under the same conditions. Extracts from the glands and mucosa of the mouth have failed to activate parotid saliva or extracts of the salivary glands of four different horses. Corn and oats passed through an oesophageal fistula show no more reducing sugar than the ground grains themselves. Mixed saliva from the oesophagus has not shown any marked potency. The glands of the mouth as well as the salivary glands produce a small amount of enzyme that will digest starch within a twenty-four-hour period."

MAIGNON, F. "Reflexions Suggested by Cazalbou's Article on 'The Utilisation of Energy by Living Beings'" (*Réflexions suggérées par la communication de M. Cazalbou sur "l'utilisation de l'énergie par les êtres vivants"*). *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 503-509.

WATANABE, C. K., OLIVER, JEAN, and ADDIS, T. "Determination of the Quantity of Secreting Tissue in the Living Kidney." *Journ. Exp. Med.* Vol. XXVIII., No. 3. September 1918. Pp. 359-376. 8 Tables.

"Under the strain induced by the administration of urea, it is possible to demonstrate the relation between the degree of anatomical damage in the kidney and the degree of defect in the urea-excreting capacity induced by uranium. The closest correlation between structure and function was obtained when the ratio between the urea content of the urine and of the blood was used as a measure of function."

POULTRY DISEASES.

SANZ EGANA, C. "Polyneuritis of Fowls" (Contribución al estudio de la polineuritis de las gallinas). *Revista Vet. Espana.* Vol. XII., No. 6. June 1918. Pp. 241-247. 1 Figure.

SEROLOGY AND IMMUNOLOGY.

BERG, W. N. "Concentration of Symptomatic Anthrax (Blackleg) Toxin." *Journ. Agric. Res.* Vol. XIV., No. 6. 5th August 1918. Pp. 263-264.

BOVIE, W. T. "The Action of the Extreme Ultra-Violet of Tropical Sunlight on the Complementing Power of Serum." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 335-344.

BROOKS, S. C. "Complement Destruction as a Measure of the Effects of Radiation." *Journ. Med. Res.* Vol. XXXVIII., No. 3. July 1918. Pp. 345-351. 2 Tables.

The work here reported is a continuation of the qualitative studies on the biological effects of tropical sunlight reported by Bovie (*vide supra*). "The decrease of complementing power suffered by serum upon exposure to ultra-violet light does not continue after the radiation is terminated."

BURNS, D. "A Note on the Influence of Guanidin on the Anaphylactic State." *Journ. Phys.* Vol. LII., No. 4. October 1918. P. xxxix.

Smith (*Journ. Nerv. and Ment. Dis.*, 1917, xiv. 26), from a clinical study of anaphylaxis, concludes that certain of the symptoms of this state are due to over-activity of the vagus. Burns and Watson (*Journ. Phys.*, 1918, lii. No. 2) have found that the administration of guanidin salts produces a block in the cardio-vagal inhibitory system. Doses of a salt of guanidin were introduced before or immediately after the administration of the toxic dose of serum. The death-rate in protected animals was lower than in unprotected animals.

CASAGRANDI, O. "The Antigen for Demonstration of Complement-Fixation in Vaccinia and Variola" (L'antigeno per la prova della fissazione del complemento nell'infezione vaccinica vaiolosa). *Ann. Inst. Pasteur.* Vol. XXXII., No. 10. October 1918. Pp. 463-470.

Contains the technique of the preparation of the virus, preparation of the leucocytes, and preparation of the culture.

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FIESSINGER, N., RANQUE, A., and SENEZ, C. "The Influence of the Medium on the Qualities of Antigens" (*Influence du milieu sur les qualités des antigènes bactériens*). *Rev. Path. Comp.* Vol. XVIII., No. 149. October 1918. Pp. 9 (197)-15 (203).

In ascitic medium a micro-organism undergoes a double adsorption—(1) an *adsorption of lipid*, and (2) *adsorption of albumin*.

FOORD, A. G. "The Effect of Exposure to Cold on Antibody Production." *Journ. Inf. Dis.* Vol. XXIII., No. 2. August 1918. Pp. 159-168. 5 Tables.

HOMER, ANNIE. "On the Concentration of Antitoxic Sera." *Journ. Phys.* Vol. LII., No. 4. October 1918. Pp. xxxi.-xxxiii. "A Note on the Nature of the Proteins Associated with Antitoxin in Antitoxic Sera." *Ibid.* Pp. xxxiii.-xxxiv. "Further Observations on the Properties of Antitoxic Sera." *Ibid.* Pp. xxxvii.-xxxviii.

KEEHN, W. G. "Vaccine Therapy in Surgery." *Amer. Journ. Vet. Med.* Vol. XIII., No. 10. October 1918. Pp. 503-505.

A brief general description of vaccines, bacterins, sera, and antitoxins, with an indication of their use, and the limitations of their use, in surgery.

KELSER, R. A. "Improved Methods of Immunisation against Symptomatic Anthrax (Blackleg)." *Journ. Agric. Res.* Vol. XIV., No. 6. 5th August 1918. Pp. 253-262. 8 Tables.

LEVADITI, C. "The Mechanism of Phagocytosis" (*Action leucotoxique du streptocoque des plaies de guerre. Considérations sur le mécanisme de la phagocytose*). *C. R. Soc. Biol.* Vol. LXXXI., No. 21. 23rd November 1918. Pp. 1064-1067.

Phagocytosis consists of four phases:—(a) The phase of attachment (exclusively physico-chemical); (b) the phase of ingestion (essentially vital); (c) the leucotoxic phase; (d) the phase of intracellular digestion. Virulence depends upon the evolution of each of these four phases.

PETTERSSON, A. "Bactericidal Action of Substances Produced by Leucocytes" (*Sur les conditions de la bactéricide provoquée par les substances leucocytaires chez l'animal*). *Ann. Inst. Pasteur.* Vol. XXXII., No. 11. November 1918. Pp. 511-521. 6 Tables.

The bacillus of anthrax in the rabbit is susceptible to the bactericidal action of leucocytes outside the cells. The receptivity of the rabbit to anthrax is, therefore, not due to prevention of phagocytosis, but to the absence of hyperleucocytosis after infection, and to the relative absence of leucocytic bactericidal substances. If an artificial hyperleucocytosis is induced, the rabbit is rendered as resistant as the dog and fowl.

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In the rabbit the bacterial substances of the leucocytes are without action on streptococci outside the leucocytes; it is only when the streptococci are ingested by the leucocytes that they are killed. It is the same with the pneumococcus.

STARIN, W. A. "The Antigenic Properties of Gelatin." *Journ. Inf. Dis.* Vol. XXIII., No. 2. August 1918. Pp. 139-158. 13 Tables.

"A study of the results of anaphylactic, precipitin, complement binding, and meisotagmin reactions shows that all were constantly negative with gelatin as an antigen in rabbits, guinea-pigs, and dogs, the recipients of the injections."

TAGAWA, K. "The Importance of Sodium Chloride in Agglutination" (*Über die Bedeutung des Salzes bei der Agglutination*). *Journ. Coll. Agric. Tokyo.* Vol. III., No. 5. May 1918. Pp. 259-289. 23 Tables. (*Über die proagglutinoidähnliche Reaktion durch Hämoglobinlösung.*) *Ibid.* Pp. 291-297. 2 Tables. (Weitere Studien über die Bedeutung des Salzes bei der Agglutination und ihre Anwendung zur Serodiagnostik des Rotzes.) *Ibid.* Pp. 299-336. 7 Tables.

TAYLOR, F. E. "The Absorption or Saturation Test of Castellani: Its Application in Sero-Diagnosis, and in the Recognition of Bacterial Species. A Critical Review." *Journ. Hyg.* Vol. XVII., No. 4. October 1918. Pp. 415-438. 10 Tables.

References to sixty-one papers are appended.

WRIGHT, A. E. "The Production of Non-Specific Bactericidal Substances by Means of Autistaphylococcic and Antistreptococcic Vaccines *in vivo* and *in vitro*" (*Sur la production de substances bactéricides non spécifiques au moyen des vaccins autistaphylococciques et antistreptococciques *in vivo* et *in vitro*.*) *C. R. Acad. Sci.* Vol. CLXVII., No. 17. 21st October 1918. Pp. 600-606. 5 Tables.

After the injection of an appropriate dose of vaccin the blood-serum attains a bactericidal property, which increases during the first few hours after the injection has been made. This property is manifest not only in the circulating blood but also in a very marked degree in the blood contained in the jugular that has been isolated completely by ligatures. The serosity collected in fragments of lint, introduced under the skin, possessed, after twenty-four to forty-eight hours, a greater non-specific bactericidal property than that observed in the blood; and on the second day, when the bactericidal property had disappeared from the blood, the subcutaneous fluid still retained its bactericidal power undiminished. These experiments seem to indicate the transfusion, in infectious diseases, of blood which has been in contact with a suitable dose of vaccin.

SURGERY.

BOND, C. J. "An *in vitro* Method of Demonstrating the 'Return Immigration' of Leucocytes in Blood Clots and in Wound Tissues." *Brit. Med. Journ.* No. 3011. 14th September 1918. Pp. 277-280. 3 Figures.

The author has already called attention to the "return immigration" of phagocytes, and its association with the spread of infection in certain diseases, and the recrudescence of local sepsis in wounds (*Brit. Med. Journ.*, 23rd December 1916, p. 861; 3rd February 1917, p. 145; this *Review*, 1917, I. 159). "The fact now established, that return immigration can take place apart from the blood or lymph circulation, affords further corroboration of this view."

CHANIER, G. A., and DUPONT. "Pyotherapy in Various Suppurative Conditions" (*Essais de pyothérapie dans les suppurations diverses*). *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 403-411.

CHARITAT, P. "Bleeding by Trocar" (*Sur la saignée au trocart*). *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 509-510.

The author points out some of the practical features of bleeding by trocar. The large trocar of the Dieulafoy aspirator or the trocar used for puncture of the cæcum appears to be the best for the purpose. The bleeding may be slow, but the diameter of the trocar should not be greater than that of a large straw. The difficulty of the operation is almost nothing.

— "Operations on Cryptorchids" (*Quelques considérations sur la cryptorchidie*). *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 411-413.

CINOTTI, F. "Tenotomy of the Flexor of the Digit in the Horse" (*Sulla tenotomia dei flessori delle falangi nel cavallo*). *Il Moderno Zooiatro. Parte Sci.*, Ser. V. Vol. VII., No. 3. March 1918. Pp. 49-60. *Ibid.* No. 4. April 1918. Pp. 73-84. *Ibid.* No. 5. May 1918. Pp. 97-106. *Ibid.* No. 6. June 1918. Pp. 126-144. *Ibid.* No. 7. July 1918. Pp. 145-158. 49 Figures.

— "Tracheostomy" (*Della tracheostomia*). *La Clinica Vet.* Vol. XLI., No. 18. 30th September 1918. Pp. 457-462. 2 Figures.

— "Castration Hobble" (*Balza pel contenimento in posizione di castrazione*). *Il Nuovo Ercolani*. Vol. XXIII., No. 21. 15th November 1918. Pp. 267-268. 1 Figure.

CINOTTI, F. "Rhinostomy: A New Operation in Cases of Paralysis of the 'False Nostril'" (*Della rinostomia: nuovo intervento operatorio nei casi di paralisi delle false narici*). *Il Nuovo Ercolani*. Vol. XXIII., No. 22. 30th November 1918. Pp. 273-278. 2 Figures.

DESLIENS, L. "New Operation for 'Quittor'" (*Note sur le javart cartilagineux (causes, traitement). Nouveau procédé opératoire*). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 319. July 1918. Pp. 297-315. 9 Figures.

D'HALLUIN, M. "Experimental Contribution to the Therapeutics of Shock" (*Contribution expérimentale à la thérapeutique du shock*). *C. R. Soc. Biol.* Vol. LXXXI., No. 17. 19th October 1918. Pp. 863-867.

ERLANGER, J., and GASSER. "The Treatment of Standardised Shock. I." *C. R. Soc. Biol.* Vol. LXXXI., No. 17. 19th October 1918. Pp. 898-905. "The Treatment of Standardised Shock. II." *Ibid.* Pp. 905-909.

GALLARATO, A. "Collections of Pus in the Maxillary Sinus of Equines" (*Sulle raccolte purulente nei seni mascellari degli equidi*). *Il Nuovo Ercolani*. Vol. XXIII., No. 22. 30th November 1918. Pp. 278-283. 1 Figure.

Purulent inflammation of the sinus may be due to direct injury (serious contusions, fractures, etc.), diffusion of inflammation from the nasal chamber, physico-chemical irritation of the mucous membrane of the nose and of the sinus, specific infectious diseases, neoplasms in the true sense of the word, and dental lesions. The author calls attention to the frequency of the dental origin of the condition. In ten cases observed by him, seven arose from disease of the teeth. The primary cause is central dental caries or caries of the root of tooth.

GAUTRELET, J., and LE MOIGNIC, E. "Treatment of Experimental Shock with Intravenous Injection of Camphorated Oil" (*Étude expérimentale du shock et de son traitement par les injections intraveineuses d'huile camphrée*). *C. R. Soc. Biol.* Vol. LXXXI., No. 10. 19th October 1918. Pp. 868-870.

HAMOIR, J. "Idiopathic Empyema of the Sinuses of the Skull" (*Considérations sur l'empyème idiopathique des sinus et principalement sur le traitement des cas rebelles dus à l'empyème des cornets*). *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 10th October 1918. Pp. 404-436. 9 Figures.

HARVEY, F. T. "B. I. P. P.—Depot Treatment of Wounds." *Vet. Record.* Vol. XXXI., No. 1584. 16th November 1918. Pp. 161-164.

"The method involves (or should) infrequent dressings, and a minimum disturbance of the patient with a corresponding saving of labour. Moreover,

the danger of reinfection of the wound—always present with frequent dressing—is greatly lessened, and it is the latter point which assumes such an important aspect in veterinary surgery, especially in large farming districts where the patients are often far afield. A system of treatment, then, where the surgeon can dress the wounds how and when he pleases, and wherein a day up or down, in removing the dressings or inspecting the wound, matters little in the ultimate result, must necessarily possess many attractions, and of all the substances so far used, none has given such good results as the Bismuth Iodoform Paraffin Paste as introduced by Morrison." The author briefly describes his experience of the method in the treatment of broken knees, wounds in the region of the stifle and elbow-joints, wounds in the orbital region, and wounds of joints in general.

[The "Bipp" method of treating wounds is described in this *Review*, 1917, I. 287, 353; 1918, II. 66, 406.]

HOBDAY, F. "Two Interesting Cases of 'Cherry's Operation.'" *Vet. Journ.* Vol. LXXIV., No. 11. November 1918. Pp. 400-401.

"Cherry's operation consists in the relieving of the tension upon sutures and in drawing together the edges of large wounds by making a parallel slit longitudinally on either side of the original wound. All three wounds then heal simultaneously, and as the two slits are always made in the direction of the hair, the resulting scars are almost (if not quite) invisible when healing has been completed."

HOOKER and WEED. "Examination of the Brains of Shell-Shocked Dogs for Intravascular Fat." *C. R. Soc. Biol.* Vol. LXXXI., No. 17. 19th October 1918. Pp. 897-898.

HOTSON, J. W. "Sphagnum as a Surgical Dressing." *Science.* Vol. XLVIII., No. 1235. 30th August 1918. Pp. 203-208.

HOWIE, G., Junr. "Bacillary Necrosis in the Horse." *Vet. News.* Vol. XV., No. 775. 9th November 1918. Pp. 388-392. 4 Figures. *Vet. Record.* Vol. XXXI., No. 1585. 23rd November 1918. Pp. 169-172. 1 Plate (8 Figures).

The author divides his cases into three classes:—(1) Simple necrosis. (2) Suppurating and sloughing necrosis. (3) Suppuration without sloughing.

KIRK, H. "Bacterial Infection of Wounds in France." *Vet. Record.* Vol. XXXI., No. 1580. 19th October 1918. Pp. 125-126.

The note calls attention to the so-called "fibrous tumour of the neck" induced indirectly by the bites of other horses. In the large majority of cases there is a small opening at the lower edge of the swelling, usually leading into a large cavity from which there is a constant discharge of pus. The surrounding tissue has the consistence of cartilage, is adherent to the skin, and shows no tendency to diminish. Surgical extirpation is the only successful treatment, and should be carried out early.

LAURIE, D. F. "Experiments in Caponising Fowls." *Journ. Dept. Agric., S. Australia.* Vol. XXII., No. 1. August 1918. Pp. 40-43.

"In certain cases one testis was left intact, in other cases both testes were completely removed, and again in some cases the removal was intra-capsular. It was soon seen that those birds in which complete removal of both testes had taken place were exhibiting the characters of normal capons. In all the others the comb and other secondary sex characters were practically normal, as in males of those breeds which had not undergone the operation."

LOUËT, F. "The Intravenous Injection of Camphorated Oil in Shock" (Les injections intra-veineuses d'huile camphrée). *C. R. Soc. Biol.* Vol. LXXXI., No. 17. 19th October 1918. Pp. 891-896.

LUCIANI, A. "Herniotomy in Equines" (L'erniotomia negli equini). *Il Moderno Zootiatro.* Parte Sci., Ser. V. Vol. VII., No. 9. September 1918. Pp. 200-201.

Works on surgery refer to herniotomy in the larger animals as inadvisable, on account of the danger to life. In the writer's opinion this is not a justifiable statement. He relates his experience in a number of cases where the operation has been successfully performed without any complications.

M'KILLIP, M. H. "Lameness: A Consideration of Predisposing Causes as Aid to Diagnosis." *Amer. Journ. Vet. Med.* Vol. XIII., No. 9. September 1918. Pp. 444-446.

"Many of the lamenesses are seen in both the young and the old, but a proper diagnosis in most of these will show that there is a vast difference between those of the young and those of the old. As a matter of fact, there may be but little similarity when the similarity of the region is excluded. . . . Those lamenesses that develop only in the young or only in the old are the ones in which the factor of age is of greatest aid in diagnosis."

— "Lameness: A Consideration of Predisposing Causes as Aid in Diagnosis." *Amer. Journ. Vet. Med.* Vol. XIII., No. 10. October 1918. Pp. 486-488.

Considers some prominent factors, relative to breed and class of work, that are productive of lameness.

MAYO, N. S. "The Chloramine Antiseptics and Disinfectants." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 139-144.

MULDOON, W. E. "Anæsthesia and Narcosis." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 166-198.

Local anæsthesia is an important form of anæsthesia in veterinary surgery, and should be more frequently employed by the practitioner. Its use alone,

or in conjunction with narcosis, should be substituted for general anaesthesia whenever possible.

NOLECHEK, W. F. "Necrobacillosis in Horses and Mules." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 150-155. 3 Figures.

"In gangrenous dermatitis, remove all necrotic tissue and a part of the healthy structure, cutting away ragged edges of skin around necrosed area. After the necrotic tissue is removed, apply bichloride pack 1-500, leave pack twenty-four hours, remove, and apply the following:—Camphora pulv., liq. cresolis compositus and phenol, of each 3 ozs.; tincture of iodin, q.s., 1 quart. Apply with swab twice daily. If part becomes filthy, wash before applying. Bandaging at this time is contra-indicated."

PERKINS, J. A. "Preliminary Report of a Method for Estimating *in vivo* the Germicidal Activity of Antiseptics." *Ann. Surgery.* Vol. LXVIII., No. 3. September 1918. Pp. 241-244. 3 Charts.

The method herein described appears to indicate that dichloramin-T in oil of eucalyptol exerts germicidal activity in a wound for from sixteen to twenty hours, while the germicidal activity of hypochlorite solution disappears before the end of two hours.

PLANTUREUX. "Castration by Torsion in Macedonia" (Le bistournage des équidés en Macédoine). *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 413-414.

SAVAGE, A. "A Combined Neurectomy Hook and Knife." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 325. 1 Figure.

SAVERY, H. M. "The Value of Flavine: A Clinical Appreciation." *Brit. Med. Journ.* No. 3011. 14th September 1918. Pp. 283-284.

SHUFELDT, R. W. "Treatment of Suppurating Corns in Horses, with a Case." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 767-771. 2 Figures.

TAYLOR, J. F. "Bacterial Infection of Wounds in France." *Vet. Record.* Vol. XXXI., No. 1584. 16th November 1918. P. 165.

The writer of this note gives his experience of the condition described by Kirk (*vide supra*).

VORONOFF, S., and BOSTWICK, E. "The Effect of Testicular Pulp on the Granulation of Wounds" (Accélération intensive du bourgeonnement des plaies par l'application de pulpe testiculaire). *C. R. Acad. Sci.* Vol. CLXVII., No. 10. 2nd September 1918. Pp. 385-387.

Pancreatic pulp retards granulation formation; testicular pulp accelerates it.

WARTHIN, A. S., WELLER, C. V., and HERRMANN, G. R. "The Ocular Lesions Produced by Dichlorethylsulphide ('Mustard Gas')."*Journ. Lab. and Clin. Med.* Vol. IV., No. 1. October 1918. Pp. 785-832.
47 Figures.

"The action of mustard gas upon the cornea and conjunctiva is essentially the same as that upon the skin. The conjunctiva is, however, less susceptible to the action, or better protected, as the degree of necrosis produced in it is always less than that in the cornea or the epidermis. Exposures to dilute concentrations of the vapour produce slight degenerations of the corneal and conjunctival epithelium, followed by a simple conjunctivitis. . . . Exposures to stronger concentrations produce a more or less complete necrosis of the corneal vertex, extending throughout the entire depth of the cornea. . . . In severe cases iridocyclitis and iritis may occur without secondary infection. The conjunctival epithelium also suffers necrosis. . . . A diffuse mild inflammation of the peribulbar tissues occurs, often with marked infiltration of the ocular muscles.

WATSON. "Copper Sulphate as a Disinfectant and Germicide." *Vet. Journ.* Vol. LXXIV., No. 9. September 1918. Pp. 326-327.

"The relative lethal action of copper sulphate compared with phenol is as 7·5 to 1; and, for example, a solution of copper sulphate 1 : 150 would be equivalent in germicidal action (under laboratory conditions) to a solution of carbolic acid 1 : 20."

WEBB, C. H. S. "A Note on the Value of Brilliant Green as an Antiseptic." *Journ. Roy. Army Med. Corps.* Vol. XXXI., No. 4. October 1918. Pp. 315-317.

In the author's opinion, brilliant green is undoubtedly an active and efficient antiseptic. It is non-irritant, acts well in the presence of serum, and possesses very definite auxetic properties. It stains dead tissue green and in this way may aid the surgeon in determining what to excise. As it is soluble in "saline" it can be used in conjunction with the "salt pack," and it can be used after the method of Carrel.

TERATOLOGY.

LOTHIAN, W. "Ectopia Cordis." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. Pp. 364-365. 1 Figure.

In a calf, born of a cow of the shorthorn type, the heart was "situated outside the thorax in the lower third of the neck, the base towards the entrance to the thorax and the apex pointing upward and forward. . . . The health of the calf was good; it was lively and took its milk greedily. . . . The post-mortem showed the heart to be nearly the same circumference throughout, the apex being bluntly rounded, which made the organ cylindrical instead of conical."

TOXICOLOGY.

ASTON, B. C. "The Poisonous, Suspected, and Medicinal Plants of New Zealand." *N. Z. Journ. Agric.* Vol. XVII., No. 1. July 1918. Pp. 6-9.

BARKER, L. F., and ROWNTREE, L. G. "Myrtol Poisoning; with Comments upon the Toxicity of Eucalyptus Oil and Myrtol in Human Beings and in Animals." *Bull. Johns Hopkins Hosp.* Vol. XXIX., No. 332. October 1918. Pp. 215-221.

"Derivatives of plants belonging to the natural order *Myrtaceæ*, and especially oil of eucalyptus and myrtol, may, in large doses, cause profound intoxication. . . . The symptoms of intoxication of the nervous system observed in man can be reproduced in animals (dogs and cats) by subcutaneous and by intraperitoneal administration of myrtol."

BOJOLY. "On Ferulism" (A propos du férulisme). *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 512-513.

This refers to Carpentier's note on poisoning with *Ferula communis* (see this *Review*, 1918, II. 486). The author is of opinion that the disease attributed to the eating of "kelkha," "kelekh" or "besbas-arami" is really a piroplasmosis due to *Piroplasma bigeminum*.

[It is interesting to note that Agostino Colombre, an Italian farrier of the fifteenth century, attributed poisonous properties to *Ferula communis* L.]

HOMER, ANNIE. "On the Toxicity of Cresylic Acid." *Journ. Phys.* Vol. LII., No. 4. October 1918. P. xxxiv.

The subcutaneous injection of solutions of cresylic acid was followed by the rapid onset of symptoms similar to those induced by the injection of solutions of phenol.

HUERTA, A. "The Extermination of Rats" (El exterminio de las ratas). *Revista Vet. Espana.* Vol. XII., No. 7. July 1918. Pp. 297-299.

Extermination is suggested by poisoning with *scillitin*, a glucoside obtained from *Urginea scilla*. The glucoside is a nervous poison, inducing paraplegia, and finally cardiac paralysis.

OSBORN, T. G. B. "Isotoma Petrea—a Suspected Poison Plant." *Journ. Dept. Agric., S. Australia.* Vol. XXII., No. 1. August 1918. Pp. 50-52. 2 Figures.

"One hundred sheep had been lost within a week on a station in the far north, presumably by eating the plant submitted, which proved to be *Isotoma petrea*. . . . Unfortunately no post-mortem was held, nor can the symptoms be described. . . . The genus *Isotoma* belongs to the subfamily *Lobelioidæ*

of the blue-bell family (*Campanulaceæ*). . . . Of the Australian species, one, *I. brownii*, evidently has a bad repute in West Australia, especially for sheep-poisoning, to judge from the references quoted by Dr. J. B. Cleland (*N. S. W. Report Bureau Microbiology*, 1912, iii. 195). No facts concerning the present species, *I. petrea*, appear to have been placed on record. On that account the present note, which, unfortunately, is not conclusive, appears to be justified."

POLLOCK, J. W. "Case of Digitalis Poisoning." *Vet. Journ.* Vol. LXXIV., No. 10. October 1918. P. 375.

It is presumed that a three-year-old Clydesdale filly had eaten foxglove. "The plants had been freely eaten, and the chewed stalks were found lying about. No post-mortem examination was made."

SMYTHE, R. H. "Arsenical Poisoning in the Horse, with Pulmonary Complications." *Vet. Record.* Vol. XXXI., No. 1576. 21st September 1918. Pp. 90-91.

THOMPSON, H. "Chronic Poisoning of Cattle with Ragwort" (*Senecio jacobaea*). *Vet. Record.* Vol. XXXI., No. 1578. 5th October 1918. Pp. 105-106.

The abdomen contained a quantity of brownish-yellow fluid; "the peritoneal covering of the abdominal viscera had a pale, wasted appearance; the liver was of a slaty-blue colour, very hard (cirrhotic), highly mottled, and gritty on cutting; the gall bladder was about twice the normal size and distended with a yellowish-green watery bile; the lining showed several small dark spots studded throughout. The first, second, and third compartments of the stomach appeared normal, except that the cuticular lining stripped off readily in some parts, but the fourth or true stomach was very highly congested, and the internal folds were of a dark bluish-pink colour and much thickened by a submucous exudation. The small intestine also showed several congested patches in different parts; and the urinary bladder was distended with a dark yellow urine."

[See also "Poisoning of Cattle with British Ragwort," Stockman, *Journ. Comp. Path. and Therap.*, 1917, xxx. 131-134: this *Review*, 1917, I. 420.]

WHYTE, J. M. "Acorn Poisoning." *Vet. Record.* Vol. XXXI., No. 1577. 28th September 1918. P. 98.

"In addition to the symptoms mentioned in the books, there is one symptom which I consider diagnostic—the frequent and abundant passage of urine, which is quite colourless."

WITHERS, W. A., and CARRUTH, F. E. "Comparative Toxicity of Cotton-Seed Products." *Journ. Agric. Res.* Vol. XIV., No. 10. 2nd September 1918. Pp. 425-452. 12 Tables, 5 Graphs.

WYNN-LLOYD, L. W. "Mould Poisoning." *Vet. News.* Vol. XV., No. 773. 26th October 1918. P. 371.

TUBERCULOSIS.

DAY, L. E. "Avian Tuberculosis in Swine." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 92-96.

During the past eight years the writer's attention has been attracted to the prevalence of tuberculosis of swine caused by the avian type of bacillus. While he does not think that this type of tuberculosis is so common in America as it has been reported to be abroad, he believes it is more frequent than is suspected.

GAIR, G. "Two Cases in Children of Tuberculosis of Supposed Bovine Origin." *Vet. Record.* Vol. XXXI., No. 1576. 21st September 1918. P. 90.

KIERNAN, J. A. "Tuberculosis and our Live Stock Industry." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. November 1918. Pp. 107-126.

Judging by the results of tuberculin testing and co-operative work, it is concluded that in at least one-half of the area of the United States tuberculosis in cattle exists to less than 1 per cent. In 1910, in the district of Columbia, 1701 cattle were tested; 18·87 per cent. reacted and were all slaughtered. The work has been continued, with the following percentages of reactors:—1911, 3·71; 1912, 2·30; 1913, 1·83; 1914, 2·03; 1915, 1·75; 1916, 1·10; 1917, 0·84; 1918, not, as yet, completed.

PENDERGAST, W. M. "Some Facts about the Tuberculin Test." *Journ. Amer. Vet. Med. Assoc.* Vol. LIII., No. 6. September 1918. Pp. 771-774.

PICKENS, E. M. "Tuberculosis in Equines." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 235-254. 3 Plates (4 Figures).

Also published in the *Cornell Veterinarian* (1918, viii. 9-25).

WILLIAMS, W. L. "Genital Tuberculosis of Cattle." *Report N. Y. State Vet. Coll., 1916-17.* 1918. Pp. 120-139. 26 Figures.

The main points of this paper have been summarised from another source (see this *Review*, 1918, II. 345).

VETERINARY REVIEW.

CONTAGIOUS ABORTION OF CATTLE: A BIBLIOGRAPHY.

THE literature on contagious abortion of cattle has grown so rapidly during the past few years that it seemed possible a bibliography might be of some service to those who wish to consult the views of recent writers. To this end, a start was made by collecting references to papers published within the last ten years. It was, however, soon realised that a time-limit had its objections and disadvantages. The appended list, therefore, contains titles of papers that can scarcely be called truly recent; but few references date farther back than 1895. This year was finally decided upon for several reasons, but chiefly because Professor Penberthy's paper (130, *infra*) contains references to the earlier literature, and should be consulted by those interested in the history of the disease.

It is perhaps necessary to say that the compiler has not been able to consult all the papers quoted, and, therefore, not having been in a position to verify all his references, he may have allowed errors to creep into the list. It is hoped, however, that these may be few in number. Nor dare it be claimed that the list is complete, for absolute completeness is not an attribute of any bibliography. Anyone detecting errors or omissions and communicating with the compiler will receive a due meed of thanks.

In some instances it has not been possible either to consult the original paper or ascertain its exact title. In such cases

it has been considered advisable to limit the reference to the name of the journal in which the article appeared.

Acknowledgment for help received has to be extended to Dr. E. C. Schroeder, of the Bureau of Animal Industry, who was good enough to supply a copy of titles in his possession. A bibliography given by Drs. Giltner, Flowe, and Potter (56, *infra*) in their paper read before the 21st Annual Meeting of the United States Live Stock Sanitary Association, held at Chicago in December 1917, and published separately in the *American Journal of Veterinary Medicine* for July 1918, has also been consulted.

1. ASCOLI, A. "Über die Reinzüchtung des Bangschen Bacillus." *Zeitschr. f. Hyg. u. Infektionskr.* 1913. LXXV. 172.
2. —— "The Significance and Duration of Immunity in Bovine Contagious Abortion." *Zeitschr. Infektionskr. u. Hyg. Haustiere.* 1915. XVII. 156-169.
3. BANG, B. *Maanedsskrift f. Dyrlæger.* 1896. VIII. 146.
4. —— *Berl. tierärztl. Wochenschr.* 1897.
5. —— "Die Aetiologie des seuchenhaften ('infectiösen') Verwerfens." *Zeitschr. f. Tiermed.* 1897. I. 241-278.
6. —— "The Etiology of Epizootic Abortion." *Journ. Comp. Path. and Therap.* 1897. X. 125-149.
7. —— "Ueber des seuchenhaften Verwerfens." *Monats. f. prakt. Tierheilk.* 1901. XII. 385.
8. —— "Infectious Abortion in Cattle." *Journ. Comp. Path. and Therap.* 1906. XIX. 191-202.
9. —— "Das seuchenhafte Verwerfen der Rinder." *Arch. f. wissen. u. prakt. Tierheilk.* 1907. XXXIII. 312.
10. BANG, O. "Schutzimpfung gegen den infektiösen Abortus." *Klimmer and Wolff-Eisner's Handbuch der Serumtherapie und Serumdiagnostik in der Veterinärmedizin, Leipsic.* 1911. 211-222.
11. BELFANTI. "Über den Wert einiger neuer Diagnosemittel beim infektiösen Abortus." *Zeitschr. f. Infektionskr. u. Hyg. Haustiere.* 1912. XII. 1.
12. BERNARDINI, D. "Sterilità e aborto." *La Clinica Vet.* 1917. XL. 331-336.
13. BEVAN, LL. E. W. "Epizootic Abortion in Cattle." *Bull. No. 50. Department of Agriculture. Rhodesia.*

14. BEVAN, LL. E. W. "A Note on Contagious Abortion." *Bull. No. 223.* Department of Agriculture. Rhodesia.
15. BOARD OF AGRICULTURE AND FISHERIES. "Report of Departmental Committee Appointed to Enquire into Epizootic Abortion." Part I. and Appendix. 1909. Part II. "Epizootic Abortion in Cattle: With Minutes of Evidence and Appendices." 1910. Extracts from Report. *Vet. Record.* 1910. XXIII. 148-150.
16. BRAEGER. "Ueber das epizootische Verkalben der Kuehe." *Deutsche Zeitschr. f. Tiermed.* 1888. XIV. 95.
17. BRULL, ZIGA. "Beitrag zur Diagnostik des infektiösen Abortus des Rindes." *Berl. tierarztl. Wochenschr.* 1911. XXVII. 721-727.
18. CHESTER. *Seventh Annual Report, Delaware Agric. Exp. Station.*
19. COOLEDGE, L. H. "A Study of the Presence of *Bacterium abortus* (Bang) in Milk." *Technical Bull. No. 32.* Michigan Agric. Coll. Exp. Station. October 1916.
20. —— "Agglutination Test as a Means of Studying the Presence of *Bact. abortus* in Milk." *Journ. Agric. Res.* 1916. V. 871-875.
21. —— "Is *Bact. abortus* (Bang) Pathogenic for Human Beings?" *Journ. Med. Res.* 1916. XXXIV. 459-467.
22. —— "Facts Disclosed in a Study of the Presence of *Bact. abortus* (Bang) in Milk by Means of the Agglutination Test." *Journ. Med. Res.* 1917. XXXVII. 207-214. (*Review*, 1918, II. 168.)
23. COTTON, W. E. "The Persistence of the Bacillus of Infectious Abortion in the Tissues of Animals." *Amer. Vet. Rev.* 1913. XLIV. 307-318.
24. COTTON, C. E. "Contagious Abortion from a Practitioner's Standpoint." *Journ. Amer. Vet. Med. Assoc.* 1916. L. 12-23.
25. —— "Sterility in Cows and its Treatment." *Amer. Journ. Vet. Med.* 1917. XII.
26. DALRYMPLE. *Bull. No. 10.* 2nd Series. Louisiana Agric. Exp. Station. 1891.
27. DESMOND. "An Outbreak of Epizootic Abortion in Cattle." *Amer. Vet. Rev.* 1913. XLIII. 604-610.
28. DESMOND, J. "The Treatment of Epizootic Abortion in Large Herds." *Vet. Record.* 1914. XXVI. 526.
29. DE VINE, B. "Epizootic Abortion in Cattle." *Vet. News.* 1910. VII. 697-702 and 713-715.
30. EDITORIAL. "The Etiology of Abortion in Cows." *Journ. Comp. Path. and Therap.* 1897. X. 66-68.
31. —— "The Infectious Abortion of Cattle." *Journ. Amer. Med. Assoc.* 1912. LIX. 1461.

32. EICHORN, A., and POTTER, G. M. "Abortion Disease as it Affects Animal Husbandry of the United States." *Report Twentieth Ann. Meeting U. S. Live Stock Sanitary Assoc.* 1916. 86-93.
33. —— "The Present Status of the Abortion Question." *Journ. Amer. Vet. Med. Assoc.* 1916. L. 295-307. (Review, 1917, I. 126.)
34. —— "Contagious Abortion of Cattle." *Farmers' Bull. No. 190.* U. S. Dept. Agric. 1917.
35. EVANS, ALICE C. "Bacillus abortus in Market Milk." *Journ. Washington Acad. Sci.* 1915. V. 122-123.
36. —— "The Bacteria of Milk Freshly Drawn from Normal Udders." *Journ. Inf. Dis.* 1916. XVIII. 437-476.
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ABSTRACTS.

CLINICAL.

A CASE OF HEART DISEASE WITH COMPLICATIONS IN THE HORSE (Di un caso di vizio di cuore combinato nel cavallo). F. LENZI.
Il Moderno Zooiatro. Parte Sci. Ser. V., Vol. VII., No. 12.
December 1918. Pp. 257-264.

This case is reported, not because of its rarity, but because the clinical manifestations did not give clear indications of the pathological lesions discovered on post-mortem examination.

A fifteen-year-old horse, suffering from epizootic lymphangitis and in a very emaciated condition, presented certain irregularities of circulation and respiration. There was evident dicroticism of respiration and symptoms of emphysema. The pulse was slow, soft, and full, with a certain amount of irregular intermittence, and was visible in the jugular vein. Percussion revealed a restricted cardiac area, consequent upon the pulmonary emphysema. There was a rough systolic as well as a presystolic murmur. On rectal examination a dilatation of the aorta could be detected.

The clinical signs seemed to point to stenosis of the aorta and relative insufficiency of the tricuspid valve, or aortic insufficiency.

On post-mortem examination the heart, which weighed 3·4 kilogrammes, was enlarged, and the pulmonary artery and aorta were markedly dilated. The wall of the right ventricle was slightly hypertrophied and its cavity considerably dilated. The endocardium, the tricuspid and semilunar valves were normal. The right atrium was dilated, with thinning of its wall. The wall of the left ventricle was considerably thickened (maximum thickness, 5·2 cm.) and its cavity slightly smaller than normal. The endocardium was the seat of a chronic inflammation, which involved the mitral valve and, in a greater degree, the segments of the aortic valve, which were retracted, rugose, and studded with small nodules. The wall of the aorta was thickened and more resistant than normal. Some centimetres from its origin the aorta contained a piriform, pedunculated, mobile tumour of the size of a bean. The lungs were markedly emphysematous.

FRACTURE OF THE GREATER (LATERAL) TUBERCLE OF THE HUMERUS:
TENOTOMY OF THE INFRASPINOUS MUSCLE (Frattura del
trochitere: Tenotomia del retrospinoso). F. CINOTTI. *Il Nuovo
Ercolani.* Vol. XXIV., No. 4. 28th February 1919. Pp. 33-37.

During the night a North American horse recovering from strangles, was cast in his stall by a too long halter rope. Several wounds and bruises were sustained, and the hair was removed from the region of the left shoulder-joint. There was considerable lameness, with a certain amount of local swelling. Though luxation of the tendon of the infraspinous muscle was a possibility, the more salient symptom of this condition—limitation of the movement of extension of the humerus on the scapula—was not noticeable. On placing the palm of the hand over the swelling, which was the size of an average egg, crepitations could be perceived when the animal was in motion and could be elicited when the horse was at rest. A diagnosis of fracture of the greater (lateral) tubercle of the humerus was made and a cold compress applied.

In order to prevent the continual displacement of the fragment of bone, it was decided to perform tenotomy of the infraspinous muscle. The operation was performed according to the subcutaneous method, the tenotome being introduced into the depression at the oral border of the deltoid muscle. The knife was inserted on the flat underneath the tendon about a finger's-breadth above the projection of the greater tubercle and was then turned so that its cutting edge was lateral, the tenotomy being completed in the ordinary way. The small cutaneous orifice was closed with collodion.

TRAUMATIC SUBCUTANEOUS EMPHYSEMA (Über traumatisches Haut-emphysem). E. WYSSMANN. *Schweizer Arch. f. Tierheilk.* Vol. LXI, No. 1. January 1919. Pp. 20-34.

After discussing the literature relative to subcutaneous emphysema, Wyssmann describes his own experience of the condition. Now and then he has observed cases of localised emphysema in cattle, but only twice has he known the condition in the horse. In one horse there was emphysema capitis, involving the right side of the head and the whole of the mandibular region, without detectable wound. Spontaneous resolution took place in the course of a few days. In the other horse there was a deep cutaneous and muscular wound on the inner side of the right elbow. Here, again, the emphysema fairly rapidly disappeared.

Of generalised emphysema he has seen nine cases—all of them in cattle. In two of them the origin of the condition was rumenotomy and puncture of the rumen. In the case following rumenotomy the

emphysema began in the region of the incision, and spread rapidly over the back, croup, sides of the chest, neck, abdomen, and the limbs as far as the carpal and tarsal joints. Appetite and peristalsis were diminished, the action of the heart accelerated, there was a moderate degree of fever, and the secretion of milk fell off in a marked manner. In three days there was improvement in the general condition of the cow, with some diminution of the emphysema, particularly of the limbs, abdomen, and neck. After another three days the greater part of the emphysema had disappeared and the general condition was practically normal.

The latest case with which the author has had to deal was that of a young cow in which normal parturition took place on the 17th January 1905. On the 29th January she suddenly began to groan so loudly as to be audible outside the building. On examination on the next day it was observed that the rectal temperature was 38.9° C., pulse 64 to 66, breathing accelerated, and very marked emphysema over the sciatic tuber of the left ischium, left croup, left side of the back, left side of the neck, and, in a lesser degree, on the right side also. There was slight groaning and an infrequent, painful cough. Auscultation revealed crepitations on the left side of the chest and percussion gave a tympanitic note. Milk secretion was diminished, and rumination and peristalsis had ceased. The treatment adopted consisted of massage and pressure. The animal recovered, but it was five weeks before the emphysema had completely disappeared.

Fifty-four references to the literature are appended.

THE TREATMENT OF SUPPURATIVE OTITIS WITH POLYVALENT ANTI-PYOGENIC SERUM (Sulla terapia delle otiti suppurate col siero antipiogeno polivalente). L. SANI. *Il Nuovo Ercolani*. Vol. XXIV., Nos. 1-2. 15th-31st January 1919. Pp. 5-11. *Ibid.* No. 3. 15th February 1919. Pp. 19-23.

Dissatisfied with the customary modes of treatment, Sani gives notes of six cases of otitis in dogs which he has treated with the polyvalent serum of Lanfranchi and Finzi. The collection of discharge, etc., was first washed out of the ear by the abundant application of 8 to 10 per cent. solution of sodium chloride. The polyvalent serum was then used as a dressing, and afterwards a tampon of gauze soaked in the serum was introduced into the ear. A hypodermic injection of 5 to 10 c.c. of the serum was also administered.

The results obtained lead the author to assert that, in different forms of suppurative otitis, the polyvalent serum affords a means of treatment attended with better and more rapid success than any other method that has been recommended.

DIETETICS.

THE EFFECTS OF DEFICIENCY OF ACCESSORY FOOD FACTORS.

1. "An Experimental Study of the Influence of Diet on Teeth Formation." MAY MELLANBY. *Lancet*. Vol. CXCV., No. 4871. 7th December 1918. Pp. 767-770. 4 Figures. *Dental Record*. Vol. XXXIX., No. 1. January 1919. Pp. 22-28. 4 Figures.
2. "The Pathogenesis of Deficiency Disease." R. McCARRISON. *Brit. Med. Journ.* No. 3033. 15th February 1919. Pp. 177-178. 1 Plate (4 Figures), 3 Charts, 4 Tracings.

1. The results of Mrs. Mellanby's observations on the influence of diet on tooth formation in puppies are summarised as follows:—

"(1) A diet containing in abundance those articles with which the fat-soluble A accessory food factor is associated—e.g., cod-liver oil, butter, etc.—allows the development in puppies of sound teeth.

"(2) A diet otherwise adequate but deficient in the substances with which the fat-soluble A is associated brings about the following defects in puppies' teeth—(a) Delayed loss of deciduous teeth. (b) Delayed eruption of the permanent dentition; in some cases the delay in the eruption of the permanent teeth is more marked than the delay in the loss of the deciduous teeth. (c) Irregularity in position and overlapping, especially of the incisors. (d) Partial absence of or very defective enamel. (e) Low calcium content; the deficiency in calcium salts may result in the teeth being so soft that they can be cut with a scalpel.

"(3) Evidence makes it clear that this is an instance of diet affecting the teeth from the inside and is independent of bacterial sepsis and other oral conditions associated with food.

"(4) These results cannot be considered as being due to acute illness of 'malnutrition,' for (a) the improvement of the teeth by the addition of fat-soluble A-containing substances (animal fats, etc.) is as characteristic as the deleterious effect of a deficient diet; (b) there is evidence that the defective teeth are most pronounced in the rapidly growing puppies, and it is difficult to associate rapid growth with illness or 'malnutrition,' as generally understood.

"(5) This work, taken in conjunction with the experiments of E. Mellanby on rickets, puts the close relationship between hypoplastic teeth and rickets on to an experimental basis."

2. Believing that a knowledge of the effect of deficiency of "vitamines" on the organs which are concerned in digestion, assimilation, metabolism, and reproduction is necessary, McCarrison has made a

number of observations on the result of feeding a large number of pigeons solely on polished rice. The following conclusions have been arrived at:—

The absence of certain accessory food factors (improperly termed "antineuritic") leads not only to functional and degenerative changes in the central nervous system but also to similar changes in every organ and tissue of the body. The morbid change is not a neuritis. The symptom-complex resulting from the absence of these substances is due (a) to chronic inanition, (b) to derangement of function of the organs of digestion and assimilation, (c) to disordered endocrine function, (d) to malnutrition of the nervous system, and (e) to hyper-renalinæmia. Certain organs undergo hypertrophy; others atrophy. The adrenals hypertrophy, while those which atrophy, and in the order of severity, are the thymus, the testis, the spleen, the ovary, the pancreas, the heart, the liver, the kidneys, the stomach, the thyroid, and the brain. The pituitary showed a slight tendency to enlargement in male birds only.

The hypertrophy of the adrenals is associated with a proportionate increase of the adrenalin content. Cœdema has invariably been associated with great hypertrophy of the adrenals, while 85 per cent. of all cases having great hypertrophy had cœdema in some form. In such cases the amount of adrenalin has been considerably in excess of that found in cases not presenting this symptom, and greatly in excess of that found in normal animals. Inanition also produces adrenal hypertrophy and a similar state of atrophy of other organs, the brain excepted.

The cœdema of inanition and of beriberi is believed to be initiated by the increased intracapillary pressure which results from the increased production of adrenalin, acting in association with malnutrition of the tissues.

Gastric, intestinal, biliary, and pancreatic insufficiency are important consequences of a dietary too rich in starch and too poor in "vitamines" and other essential constituents of food. A state of acidosis is due to imperfect metabolism of carbohydrates and to acid fermentation of starches in the intestinal tract.

Great atrophy of muscular tissue results from deficiency of accessory food factors, and is due in part to disturbance of carbohydrate metabolism in consequence of disordered endocrine function, in part to the action of the adrenals in supplying blood to the vegetative organs of the body at the expense of the muscles.

Profound atrophy of the reproductive organs, leading to cessation of spermatogenesis, is an important consequence of "vitaminic" deficiency. The central nervous system atrophies little; paralytic symptoms, when they occur, are due mainly to impaired functional activity of the nerve cells, much more rarely to their degeneration.

Because the atrophy of the thymus, testis, ovary, and spleen are out of all proportion to atrophy of other tissues, it is thought that these organs provide a reserve of accessory food factors for use on occasions of metabolic stress. The reserve, however, is rapidly exhausted.

Bones are thinned, there is loss of bone-marrow, and the red cells of the blood are diminished by about 20 per cent.

The whole morbid process is believed to be the result of nuclear starvation of all tissue cells. Accessory food factors are nuclear nourishers. "Vitaminic" deficiency renders the body very liable to be overrun by the rank growth of bacteria.

NET ENERGY VALUES OF ALFALFA HAY AND OF STARCH. H. P. ARMSBY and J. A. FRIES. *Journ. Agric. Res.* Vol. XV., No. 5. 4th November 1918. Pp. 269-286. xv.+8 Tables.

These experiments were undertaken to determine the nett energy value of starch as a representative of the carbohydrates. Alfalfa hay was used as roughage so that the ration should not be too low in protein and also to compare the results of other experiments. A pure-bred shorthorn steer one year and ten months old was used.

Seven respiration calorimeter experiments were made. It was found that the digestibility of the rations, the losses in the urine, and the extent of the methane fermentation showed a distinct increase as the total amount of the ration was reduced; the greater loss of energy in the urine and methane on the lighter rations more than compensated for the smaller losses in the faeces, so that the proportion of the total energy metabolisable was somewhat less than on the heavier rations. The metabolisable energy of the starch was 10 per cent. greater than the average computed from five experiments by Kellner, the differences being chiefly due to smaller losses in the faeces. Starch caused the usual depression in digestibility. The average heat increment caused by the consumption of alfalfa hay was 999 calories per kilogramme of dry matter as compared with 981 calories found for the same hay in the previous year and with an average of 1169 calories in six previous experiments on three different samples. The average heat increment for the starch was 1692 calories per kilogramme of dry matter as compared with 1428 calories computed from Kellner's experiments.

The nett energy values of the starch was about 9 per cent. lower than that computed from Kellner's experiments, only 49 per cent. as compared with 59 per cent. of the metabolisable energy being utilised by the animal.

(R. G. L.)

THIRD REPORT ON CATTLE FEEDING EXPERIMENTS CONDUCTED AT THE SCHOOLS OF AGRICULTURE AND EXPERIMENT FARMS AT CEDARA, NATAL, AND POTCHEFSTROOM, TRANSVAAL. *Bull. No. 8.* Dept. Agric. Union of S. Africa. 1918. Pp. 47. 23 Figures, 14 Tables.

A record of three feeding experiments with cattle. The first aimed at determining the most efficient ration for fattening old oxen, using as far as possible only farm foods, and also to study the desirability of using old trek oxen in stall-feeding for slaughter purposes. It was found that old trek oxen varied greatly in their power to fatten; bad doers should be early discarded. When turned on to mealie stalks, before stall-feeding, they made an average daily gain per head of 1 lb. When stall-fed, the average daily gain was less than 1 lb. per head; this fall off in increase is attributed to the age of the animals, to the prevailing bad weather, and to the fact that they had already acquired their initial gain, or "fill-up," while on the mealie stalks. The maintenance ration of such big-framed cattle is large. It appears to be economically sound to run old trek oxen on mealie stalks for six to eight weeks and then to finish in stalls for such period as satisfactory gains continue to be made. The trial indicates that a ration poor in nitrogen may be used successfully in fattening old oxen.

The second experiment was to determine the relative efficiency of the different types of oxen for economic beef production. The animals used were:—Aberdeen - Angus, Shorthorns, Herefords, Africanders, crossed Sussex and Africander, and crossed Hereford and Africander. Their ages ranged from three and a half to five years, and they had not been used in the yoke. The Shorthorns and Herefords made better gains than the Africanders or Africander crosses; the latter were in better feeding condition at the start. Shorthorns and Herefords showed the highest feed cost; Sussex and Hereford cross and Sussex and Africander cross brought in the highest carcass income, the Aberdeen Angus, being less mature at the start, brought the smallest nett profit.

The third experiment had for its object the determination of the most efficient ration for fattening three-year-old oxen, using as far as possible only farm-grown foods. Twenty good grade Shorthorns were used. They were taken straight off the veld and were very wild. Peanuts with their husks gave poor results with mealie hay, probably on account of the bulkiness of the ration and deficiency of protein. Molasses is considered a desirable substitute for other carbonaceous concentrates, but should not be given in greater quantity than 5 lbs. per day or it will cause diarrhoea.

(R. G. L.)

INFECTIOUS DISEASES.

SWINE FEVER.

1. "The Survival of the Hog-Cholera Virus in Laboratory Animals, particularly the Rat." C. TENBROECK. *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 749-757. 1 Table.
2. "A Study of Paratyphoid Bacilli Isolated from Cases of Hog Cholera." C. TENBROECK. *Ibid.* Pp. 759-777. 14 Tables.
3. "Hog-Cholera Control in the East." E. A. CAHILL. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 314-321.
4. "Transmissibility of Immunity from Mother to Offspring in Hog Cholera." C. L. M'ARTHUR. *Journ. Inf. Dis.* Vol. XXIV., No. 1. January 1919. Pp. 45-50.
5. "Observations Concerning the Dissemination of Hog Cholera by Insects." M. DORSET, C. N. M'BRYDE, W. B. NILE, and I. H. RIETZ. *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 55-60.
6. "Salicylic Acid as a Remedy for Chronic Hog Cholera." D. J. HEALY. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 633-638.

1. Although it has been stated that the mouse, rat, guinea-pig, rabbit, dog, cat, horse, donkey, sheep, cow, goat, pigeon, chicken, goose and duck are not susceptible to inoculation with the virus of swine fever, TenBroeck hoped that by using some of the less common methods of inoculation, and by carefully observing the animals, some species other than pigs might be made available for work on swine fever. It was found, however, that attempts to demonstrate the virus in rabbits twelve days after intravenous and intra-abdominal inoculation were unsuccessful. The attempts also to show that the virus might be found in the guinea-pig six and in the pigeon seven days after inoculation were negative. It was shown, however, that the virus can be found in the bodies of white rats for at least seven days after intra-abdominal or intracerebral inoculation. One attempt to demonstrate it after ten days was negative. Rats show no evidence of illness, such as loss of weight, pyrexia, or visible pathological changes, and after either intra-abdominal or intracerebral inoculation the virus is found only in the abdominal organs and possibly only in the spleen. It seems likely, therefore, that the virus does not multiply, but that in the rat tissue, and particularly in the spleen, it is not destroyed so rapidly as in the

organs of other animals. It was not shown that passing one strain of virus alternately through pigs and rats for three transfers in each species can change the virulence for pigs or cause the virus to become virulent for rats. Attempts to introduce the virus into the rat by feeding and an attempt to pass the virus from one lot of rats to another were unsuccessful. This affords evidence that the rat does not play a part in the transmission of swine fever.

2. "During the course of some experimental work on hog cholera, paratyphoid bacilli were isolated from 16 per cent. of the pigs. Culturally these organisms are the same as paratyphoid B isolated from man, while they show several differences from hog-cholera bacilli. In their slight pathogenic effect on rabbits they also differ from the hog-cholera bacillus. In their agglutination in sera produced by the injection of living cultures, one of the cultures, isolated from a chronic case, corresponds to *Bacillus enteritidis*, while the other five are apparently in a class by themselves. They resemble paratyphoid B more closely than hog-cholera bacilli, but the type of clumps formed and absorption experiments show that they are different from either. Whether these differences are enough to make it necessary to put them into a class by themselves is questionable, but the fact that when injected into rabbits they produce an immunity to hog-cholera bacillus, while paratyphoid B does not, is additional evidence in favour of such a classification. Complement-fixation experiments have been of little value in differentiating the members of this group, but, on the contrary, show their close relationship. It seems probable that some of the cultures that are described in the literature as hog-cholera bacilli really belong to this group, which would account for much of the confusion that exists in the classification of the interesting, truly pathogenic bacillus that at one time was thought to be the cause of hog cholera, and in the series of animals with which we have worked has not appeared once. Whether the ingestion of pork containing these bacilli would cause disease in man is a question that can only be decided by a more careful bacteriological study of the organisms causing food poisonings and paratyphoid fever."

3. Cahill discusses the measures that have been taken in the State of Massachusetts for the control of swine fever. "Briefly, the important points of the Massachusetts system may be given as follows:—All anti-hog-cholera serum and hog-cholera virus to be used in that State are tested by the Department of Animal Industry upon their arrival, regardless of any previous tests. If these products pass a satisfactory test they can then be administered only by veterinarians who are employed by and are responsible to the State. The outstanding advantages of this method may be summarised as follows:—(1) It

prevents the use of virus which lacks virulence and serum lacking potency. (2) It minimises faulty technique. (3) It unifies the method of application, dosage, and technique. (4) It makes possible the enforcing of quarantine and sanitary regulation which cannot possibly be obtained by the private veterinarian, regardless of professional ability. (5) It makes possible the procuring of accurate reports, data, and statistics. In more than four years since the adoption of this method there has not been an instance where non-infected territory has become infected from the use of virus, nor where the disease has been spread by its use."

Previous to 1915 it was customary to administer the simultaneous method to pigs from two to eight weeks of age. It was felt to be necessary to determine whether many of these animals would retain sufficient immunity from the original treatment to make a permanent immunity from a second treatment an uncertainty. To decide this point, 852 pigs weighing 15 to 30 lbs. were given 30 c.c. of serum and 2 c.c. of virus. The animals were kept under environment to which they were accustomed, and at varying periods were injected with 4 c.c. of virus each. The experiment showed that a large percentage of animals treated as "baby pigs" fail to retain their immunity for a lengthy period. From 52 to 72 per cent. of all animals so treated failed absolutely to carry sufficient immunity to protect them against the disease when exposed to a really virulent infection a short time afterwards. Consequently the application of the simultaneous method to "baby pigs" was discarded as a control measure. The experiment also showed that attempts to obtain permanent immunity by repeating the simultaneous treatment were too uncertain. As a State control method it was considered dangerous and was discarded. Young pigs are now treated as follows:—"At weaning time (usually six weeks in the East) pigs are given serum-only treatment; six weeks later they are given the simultaneous treatment, using 2 c.c. of virus. Since adopting this method outbreaks of hog cholera in herds so treated are practically unknown, regardless of the length of time the animals are kept or the amount of infection to which they are exposed."

4. Because of the importance of the question of the transmissibility of immunity from mother to offspring and the small amount of experimental data available, M'Arthur has conducted experiments with sows immune from the Dorset-Niles treatment. None of the sows had been treated with antiserum, nor, so far as was known, were they immune as the result of exposure to or passage through an outbreak of the disease. As soon as they were received in the experimental pens they were given the Dorset-Niles antiserum with virus. The results of the experiments show that immune sows transmit their immunity to their

offspring. In nearly every case the pigs retained their immunity so long as they were suckling and the sow was immune. When the mother contracted swine fever, the young did not usually survive for more than a few days, and in some cases swine-fever lesions were found on post-mortem examination. There was apparently little difference in susceptibility of the sucklings to different modes of exposure. The duration of the immunity after the time of weaning was only tested to a limited extent. Though different pigs vary, in most cases the immunity lasted a few weeks after weaning. Second litters were as immune as the first litters, and in some instances even more highly immune while suckling. How the antibodies are transmitted from mother to offspring is open to question, but the above results would indicate that the antibodies are transmitted through the milk during the entire suckling period.

5. In their endeavour to determine how far flies may be responsible for the transmission of swine fever, Dorset and his fellow-workers have carried out series of experiments with the house-fly and the lesser house-fly (as representing the non-blood-sucking flies) and *Stomoxys calcitrans* (as representing the biting flies). House-flies and lesser house-flies were made to come into contact with the eyes of pigs suffering from swine fever and the eye secretion that had been removed from sick pigs. At various periods these flies were ground up with sterile salt solution and injected into susceptible pigs. The results show that house-flies thus infected harbour the virus of swine fever for at least twenty-four hours. Next, house-flies were allowed to feed on the blood of sick pigs. Susceptible pigs were then injected with one fly each, the flies having been kept for two, three, four, five, six, and seven days after feeding on the blood. All the injected pigs died of swine fever.

House-flies were brought into contact with the eye secretions of a sick pig, and then were made to touch the eyes of a healthy pig. Thirty-two pigs were thus exposed to eight infected flies: twenty-four of them died of swine fever, four took the disease in a subacute form, and four remained well. These and similar experiments show that swine fever is very easily transmitted by transferring the eye secretions of sick pigs to the eyes of healthy animals. A few experiments with nose secretions were also carried out, and the results were the same as with the eye secretion.

House-flies that had fed naturally on the eyes of sick animals were allowed to feed on artificial abrasions or scratches on the ears of healthy pigs. Of the five pigs thus exposed to infection three contracted hog cholera. Four other healthy pigs were similarly exposed to flies that had fed on the blood of a sick animal. Two of them contracted acute swine fever and died with typical lesions.

In order to approximate the natural conditions more closely, infected

flies were placed in screened pens containing healthy pigs. Only one animal contracted swine fever twenty-five days after the first exposure to the flies and six days after the last exposure, but no particular stress is laid on this single positive result.

Stable-flies were allowed to feed on diseased pigs, and then were ground up with sterile salt solution and injected into healthy animals. All pigs thus injected developed swine fever. Stable-flies that had fed on diseased pigs were caused to bite sixteen healthy animals. To the results of this experiment the authors call special attention, "because here, apparently, five out of sixteen pigs became infected by the bites of these stable-flies, but a peculiar thing about these experiments was that the period of incubation of the disease in the pigs that contracted cholera was considerably longer than is customarily seen in hog cholera. The pigs that died showed the first symptoms on the twelfth, fifteenth, seventeenth, and twentieth days respectively." Experiments in which healthy pigs were caused to eat dead infected stable-flies gave varying results.

Screened pen experiments, similar to those carried out with the house-fly, were undertaken with the stable-fly. "The results of these experiments were very different from those with the house-fly, because in five of the seven pens the pigs came down very promptly with cholera. In the remaining two pens the pigs remained apparently healthy, and, when tested later, seemed more resistant than the average to cholera. There is no doubt in our minds that these pigs contracted cholera from the stable-flies."

6. The continued presence of swine fever in the United States for more than fifty years is probably mainly due to the occurrence of the disease in the chronic form during the intervals between epidemics of acute swine fever. Competent observers estimate that 2 to 20 per cent. of the total loss from swine fever is attributable to the chronic form of the disease. "Chronic hog cholera resembles, in a general way, the acute form of the disease, yet all the symptoms are much milder and the sick hogs live much longer than do those hogs acutely sick. In the chronic form of the disease the temperature is misleading, the appetite may remain normal for several days and then disappear altogether; as a rule, there is diarrhoea and marked emaciation, the animal finally dying after several weeks or months. The only post-mortem lesions which are characteristic of chronic cholera are ulcers of the mucous membrane of the stomach and intestine."

Healy has administered salicylic acid in the drinking water of pigs affected with the chronic form of swine fever. Out of twenty pigs so treated, eighteen, or 90 per cent., recovered. Fifteen animals suffering from the acute form of the disease were treated in the same manner,

and all died. "It therefore appears that the author found salicylic acid a distinctly effective remedy in chronic hog cholera, although of no value whatever in the acute form of the disease."

HÆMORRHAGIC SEPTICÆMIA.

1. "Hemorrhagic Septicemia, its Clinical Diagnosis." H. JENSEN.
Journ. Amer. Vet. Med. Assoc. Vol. LIV., No. 1. October 1918. Pp. 39-47.
2. "Complicated Hemorrhagic Septicemia in Hogs." E. B. CARTER.
Amer. Journ. Vet. Med. Vol. XIII., No. 12. December 1918. Pp. 579-581, and 635.
3. "Mixed Bacterins in Hemorrhagic Septicemia." I. S. ALFORD.
Amer. Journ. Vet. Med. Vol. XIII., No. 12. December 1918. Pp. 582-584.
4. "Contribución al estudio de las 'Pasteurelosis.' 'Septicemia hemorragica ovina.'" S. SAFFONS. *Revista Zootecnica.* Vol. VI., No. 62. November 1918. Pp. 153-154.

1. Jensen discusses hæmorrhagic septicæmia as he has seen it in Texas. The disease attacks young animals more than old ones, and those that are thin and poorly nourished are most susceptible. Great mortality is produced, and various species of animals, especially cattle, sheep, and swine, may be attacked. True "swine plague," due to the *B. suisepicus* alone, is very rarely met with in the field, the disease commonly so-called being nearly always a mixed infection. Fowl cholera represents the avian form of hæmorrhagic septicæmia and sometimes causes great losses.

From the clinical and pathological manifestations, hæmorrhagic septicæmia may be held as assuming the following forms:—(1) Pectoral or pulmonary, (2) subcutaneous, (3) cutaneous, and (4) enteric.

In the pectoral form the period of incubation in natural infections varies from six hours to eight days, and the characteristic symptoms are those of an acute pleuro-pneumonia. The lungs may be dark in colour and much thickened, with collections of blood-serum in the meshes of the lung tissue, or they may be consolidated. On section there is grey and red hepatisation, with the marbled appearance, as seen in contagious pleuro-pneumonia.

In the subcutaneous form of the disease there are swellings under the skin of the head, throat, or dewlap; the tongue is often swollen, and there is salivation. There are often small hæmorrhages underneath the mucous membrane of the nose. Swellings of the legs and joints may be observed. Some animals die of asphyxia due to swelling in the

region of the throat. On post-mortem examination hæmorrhagic areas are found in the subcutaneous tissue, but the number and size of these vary greatly. Some animals exhibit very few hæmorrhagic areas, while others present areas so extensive that possibly one-eighth of the body surface is involved. The subcutaneous swellings are caused by a sero-fibrinous exudate, usually yellow in colour but occasionally dark red. Close examination shows that the muscles contain minute hæmorrhages. Lymph glands are frequently, but not uniformly, enlarged, the cervical and prescapular glands being most seriously affected.

The cutaneous form, originally known as "mad itch," is rare, and has apparently never been seen in some districts. There is intense itching and nervousness, and large areas of skin may be entirely denuded of hair and rubbed to a raw sore. The animal affected generally dies in from twelve to seventy-two hours, and it is difficult to differentiate this form of the disease from rabies or cerebral disorder: examination of the blood, however, reveals the presence of the typical bi-polar staining organism. Though in many instances typical diagnostic lesions are absent, there are usually small petechiae in the subcutaneous tissue, and in the muscle of the heart and the fat about its base. Some petechiae are found over the atria (auricles) of the heart, but for some unaccountable reason hæmorrhages over the ventricles towards the apex, so often found in other forms of the disease, are absent in the cutaneous form. Hæmorrhages occur in the membranes of the brain and spinal cord, and the cerebro-spinal fluid has a more or less red tinge.

The enteric form of the disease may develop after the pulmonary form has been established. There are usually symptoms of colic, with much straining, and the ejection of thin, foetid faeces mixed with flakes of fibrin and mucus and blood. There are, however, many cases in which the faeces are normal except for the presence of blood streaks, while, on the other hand, the intestinal mucous membrane may be so extensively affected that large portions of it are expelled with the faeces, and the contents of the bowel in this condition may have the appearance of pure blood. In certain districts the enteric form of the disease is very rarely encountered. Post-mortem examination reveals extensive inflammatory changes in the stomach and intestines.

In sheep, young animals which have just been weaned are most susceptible to hæmorrhagic septicæmia, the disease assuming an acute form, with high temperature, muscular tremblings, discharge from the eyes and nose, and colicky pains. The duration of the disease is usually very short, though it may become a chronic infection of the lungs with gradual emaciation. Sometimes the joints are involved, swelling of the knees being noticeable in some instances. The disease may be so acute and the animals die so suddenly that no distinct lesions are discoverable

on post-mortem examination, except petechiae in the heart, lungs, and spleen, and congestion of the lymph glands.

In pigs the disease sometimes manifests itself in a hyperacute form with symptoms of general septicæmia. Red spots may appear on various parts of the body, and especially round the ears and on the neck and rump. The animal usually dies within a few hours after the first appearance of symptoms. In acute cases the disease occurs as a necrotic pleuro-pneumonia, with symptoms and lesions similar to those of swine fever.

In cattle there may be some difficulty in distinguishing clinically between haemorrhagic septicæmia and anthrax, blackleg, malignant œdema, or rabies.

2. Carter reports that considerable confusion has been caused by an epidemic of haemorrhagic septicæmia in pigs in Indiana, U. S. A., because of the close resemblance of the lesions to those of swine fever. The confusion has been made greater by the fact that the infection frequently follows the injection of anti-swine-fever serum and virus by the simultaneous method. The author explains this by the assumption that lowered resistance, caused by exposure, under-nourishment, or the injection of virus, affords an opportunity to the *Bacillus suisepcticus*, which is frequently found as a normal inhabitant of the respiratory tract of healthy pigs.

The bacteriological examination of an extensive amount of material from pigs which had died of haemorrhagic septicæmia revealed the presence of the following organisms:—*Bacillus suisepcticus* in 50 per cent. of cases; *Bacillus suipestifer*, 25 per cent.; *Bacillus coli*, 88 per cent.; *Bacillus pyocyanus*, 13 per cent.; *Streptococcus*, 38 per cent.; *Pneumococcus*, 25 per cent.; *Staphylococcus aureus* and *S. albus*, 50 per cent. The pathological lesions were very similar in all cases. "Petechiae were common, particularly in the bladder, on the serous surface of the stomach, and on the intestines and mesentery. In most cases necrotic areas were found in many places throughout the intestines, and in a few cases the necrosis had progressed to such a point that perforation had taken place. Most striking of all were the lesions in the lungs. These varied all the way from hard mottled areas, which were filled with bloody mucus, to distinctly necrotic and suppurating lesions." In no case was the *Bacillus necrophorus* discovered.

A special vaccine was prepared containing the various bacteria in the percentage in which they occurred in the natural cases. Most of the reports on its use have been from cases in which the disease already existed, and in every case the results have been most gratifying.

3. Alford's experience of haemorrhagic septicæmia in cattle leads him to the conclusion that animals coming from stockyards, if shipped

in good dry weather, properly housed, and not allowed to stand in muddy yards or get drenched with cold rain, have a fair chance to recover without treatment. Mixed vaccine, in his opinion, is the only successful treatment. Medicinal treatment is of little value, except where there are complications, when intestinal antiseptics and stimulants are of some help. The author suggests that all steers be given 2 c.c. of haemorrhagic septicæmia bacterin as soon as possible after arrival at their destination. When the animals are already affected, he recommends 4 to 5 c.c. as the initial dose. As a preventive, 2 c.c. has proved to be a sufficiently large dose.

4. Saffons has recently had to deal with an extensive outbreak of haemorrhagic septicæmia in sheep in Argentina, where the mortality amounted to 480 head out of 1400. It is noteworthy that horses, cattle, and pigs, though in constant promiscuity with the sheep, were not affected. As prophylaxis, he recommends: That wells and ditches should be closed or filled up; the dead bodies should be cremated after removal of the skin, which should be dressed with a 3 per cent. solution of creolin; dogs should not be allowed to eat the flesh or intestinal residues of animals that have died of the disease; and the place where the dead bodies have lain should be covered with ground lime.

CONTAGIOUS ABORTION.

1. "An Improvement in the Method of Isolating and Recovering the Bacillus of Cattle Abortion through Guinea-Pigs." E. W. SMILLIE. *Journ. Exp. Med.* Vol. XXVIII., No. 5. November 1918. Pp. 585-605. 2 Figures, 6 Tables.
2. "Spirilla Associated with Disease of the Fetal Membranes in Cattle (Infectious Abortion)." T. SMITH. *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 701-719. 2 Plates (7 Figures).

1. Up to 1912 the only method available for the isolation of *B. abortus* Bang was the culture method. In 1912, however, Smith and Fabyan (*Centralbl. Bakteriol.*, I. Abth. Orig., 1912, Ixi. 549) showed that *B. abortus*, when inoculated into guinea-pigs, produces a disease with well-defined characters, and that the bacillus can be isolated from these animals after three or more months. This method proved valuable, because culture methods frequently fail when badly soiled foetal membranes are the objects of investigation. The investigations now described by Smillie were to determine whether it might be possible to shorten the life period of the inoculated guinea-pigs without impairing the chances of obtaining cultures. The material used to inoculate the guinea-pigs was derived from pure cultures as well as from tissues of

fœtuses and fœtal membranes. The guinea-pigs were inoculated either subcutaneously or into the abdominal cavity. When the animals were considered ready for bacteriological examination they were killed, the lesions noted, and the following procedure adopted:—

"Ordinary veal peptone agar tubed and slanted is the medium employed. The surface of the organs from which cultures are to be made is, if necessary, seared with a heated spatula. Bits of tissue about the size of split peas are then torn out of the organ with sterile forceps, rubbed over the entire surface of the agar with a platinum loop, and finally pushed down into the condensation water. The cotton plugs are clipped off level with the tops of the tubes. The tubes at this point are thoroughly heated in the flame to kill any spores adhering to the contained cotton plugs as a result of handling, and after the tubes have cooled somewhat they are hermetically sealed with a layer of sealing wax. They are then incubated at 37° C. Colonies of *Bacillus abortus* are usually observed on the agar slant after five to ten days' incubation."

Cultures were prepared from lungs, liver, kidneys, and spleen in all cases; from the superficial inguinal glands when the animal had been given a subcutaneous injection; from the retro-gastric lymph glands when the injection had been intra-abdominal; and from the testis and the ovary or uterus. In those tubes where no growth appeared in from six to ten days the condensation water containing the bit of tissue was shaken so as to cover the agar surface, and the tubes were returned to the incubator. The identification of *B. abortus* was effected by both macroscopic and microscopic examination of the colonies, and the diagnosis of infection with *B. abortus* was strengthened by a macroscopic examination of the organs of every guinea-pig employed. As is now well known, in positive cases the spleen is much enlarged, highly congested, more or less nodular on the surface, and the Malpighian bodies may be enlarged and show through the capsule. In addition to this characteristic lesion, one or both testes may be attacked, and the epididymis converted into an indurated, centrally necrotic mass. Minute nodules in the liver are found in most cases.

The experiments demonstrated that *B. abortus* can be regularly recovered from guinea-pigs inoculated with material containing the bacillus within three or four weeks after inoculation. Figures obtained show that the number of living bacilli in the spleen is larger at that time than later, although the macroscopic lesions tend to become more prominent as the bacteria decline. It remains to be seen whether the period cannot be shortened still more.

The method is especially useful in recovering the organism from fœtal membranes which, as a rule, are obtained after coming into contact with faecal matter, bedding, etc.

The spleen is the organ in which the bacteria are regularly present and in the largest numbers. Cultures must be made from it to ensure success.

2. In the course of an investigation by Smith into an outbreak of contagious abortion a fair number of cases were encountered in which the *Bacillus abortus* Bang could not be isolated from the foetus or placenta. These cases comprised (a) a few foetuses yielding sterile cultures, (b) those yielding rapidly growing cultures of colon-like and other bacteria, and (c) those yielding pure cultures of a spirillum. In all, fourteen cases have come under observation from which pure cultures of the spirillum have been obtained, and in none of these was it possible to find the abortion bacillus of Bang. These cases indicate that the lesions associated with the organism are largely, if not exclusively, restricted to the foetal membranes, and that the foetus suffers secondarily from a progressive interference with the placental circulation. This is what occurs when *Bacillus abortus* invades the chorion and cotyledons, and it was therefore to be expected that the change in the foetus would be much the same in both etiological types. This was the case. It was impossible to foretell whether a given foetus would yield cultures of *Bacillus abortus* or of the spirillum, or none at all.

"The injurious action of the etiological factor when spirilla are present is limited to the foetal membranes, more particularly the chorion. Definite lesions of the foetus were not detected. The spirilla gain access to the digestive and respiratory organs of the foetus when the latter swallows the amniotic fluid. More rarely they are disseminated through the body, probably through the circulation. The spirilla will grow in certain culture media only under reduced oxygen tension, readily secured by sealing the ordinary culture tubes with sealing wax. Laboratory animals (mammals) are refractory. The precise relation of the spirillum to the pathologic process remains to be more definitely formulated. Since the spirillum was first isolated, twenty-seven cases have been found associated with *Bacillus abortus* and fourteen with the spirillum. In none was a mixed infection with both organisms detected. The spirillum has been isolated only from the second and succeeding pregnancies."

EPIZOOTIC LYMPHANGITIS.

1. "Quelques observations sur la lymphangite épizootique. Méthode Velu et méthode Belin." CAPMAU. *Rec. Méd. Vét.* Vol. XCIV., Nos. 16-18. 30th August - 30th September 1918. *Bull. Soc. Centr. Méd. Vét.* Pp. 337-360.
2. "Le associazioni batteriche nelle infezioni da *Cryptococcus Farcininosus* (Rivolta 1873)." M. CARPANO. *Ann. d'Igiene.* Vol. XXVIII., No. 6. June 1918. Pp. 273-279.

3. "Note sur le traitement de la lymphangite épidémiologique par le sérum de cheval guéri." P. LATOUR. *Bull. Acad. Méd.* Vol. LXXX., No. 30. 30th July 1918. Pp. 141-143.
4. "I cristalli di solfato di rame nel trattamento delle congiuntiviti da lynnosporidium." P. CREMONA. *Il Nuovo Ercolani.* Vol. XXIII., No. 24. 31st December 1918. Pp. 305-308.
5. "La lymphangite épidémiologique des solipèdes. Parasitologie et étude expérimentale. Traitement et prophylaxie." A. BOQUET, L. NÈGRE, and G. ROIG. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 323. November 1918. Pp. 553-566. *Ibid.* No. 324. December 1918. Pp. 617-634. 3 Figures.
6. "L'infection, la sensibilisation et l'immunité dans la lymphangite épidémiologique des solipèdes." A. BOQUET and L. NÈGRE. *C. R. Acad. Sci.* Vol. CLXVIII., No. 8. 24th February 1919. Pp. 421-423.
7. "Contributo pratico alla terapia del farcino criptotoccico." G. RUGGERINI. *La Clinica Vet.* Vol. XLI., Nos. 1-2. 15th-31st January 1919. Pp. 1-10. *Ibid.* No. 3. 15th February 1919. Pp. 69-83.

1. Capmau has conducted four series of vaccinations in cases of epizootic lymphangitis, in order to test the relative efficacy and preferability of the methods of Velu and Belin:—(1) Autopyotherapy (Belin) without surgical interference; (2) autopyotherapy (Belin) with puncture of the abscesses; (3) autopyotherapy (Belin) with extirpation of the lesions; (4) pyotherapy (Velu) with extirpation. Both the Velu and the Belin method with *extirpation* give excellent results, but there are two reasons why that of Velu is preferable. First, it is difficult to secure pus, or pus in sufficient amount, to carry out the procedure of autovaccination. Secondly, the method of Belin may induce local reaction (*cœdema*, abscess formation).

The method recommended is a modification of that of Velu:—(1) The lesions should be removed *before* the process of vaccination is begun. (2) Either immediately after the extirpation of the lesions, or in a day or two, 4·5 to 6 c.c. of the pyovaccine is injected, the dose depending on the animal and the extent of the lesions. (3) A second injection of 1 or 0·75 c.c. of the pyovaccine is given after ten or twelve days. (4) The subsequent injections, at six- or seven-day intervals, should not be greater than 0·75 c.c. (5) Surgical interference as early as possible.

2. In a limited outbreak of epizootic lymphangitis occurring near Rome the pus from the lesions was examined and a note was made of the organisms present therein. In five cases the cryptococcus alone was present; in six cases the cryptococci were associated with *Staphylo-*

coccus aureus and *S. albus*; in one case a non-specific pyogenic organism was present along with cryptococci, and in another case the cryptococcus was associated with *Staphylococcus pyogenes*, a streptococcus, *B. subtilis*, *Proteus vulgaris*, and various species of *Hyphomycetes*.

Further material obtained from early and closed lesions, taken with precautions against outside contamination, was similarly examined. Out of the forty-one cases in which microscopic examination revealed the presence of the cryptococcus, in fifteen instances the cryptococcus was associated with both streptococci and staphylococci, in ten cases with streptococci alone, and in two cases with staphylococci alone. The streptococci could not be differentiated from the causal organism of strangles, and the staphylococci were representative of almost all varieties of *Staphylococcus pyogenes*.

3. Latour briefly describes the effect on epizootic lymphangitis of the injection (subcutaneous or intravenous) of the serum from a horse which had been cured of the disease. From his observations on twenty-eight animals he concludes that the method is absolutely harmless. Rigorous aseptic preparation of the serum has ensured the absence of abscess formation, the absence of any reaction, local or general, and the absence of any elevation of temperature. The injections have a very desirable effect on the general and local condition of the disease. In a few days improvement is marked, the development of the lesions is arrested, the purulent foci dry up, and cicatrisation is effected. Hypertrophy of the lymph glands disappears.

In these experiments the serum has been injected subcutaneously in the majority of the cases, and either in fractional doses (10 to 20 c.c. each day until cure is effected) or in massive doses (100 c.c. on the first day, 100 c.c. four or five days later, and so on). The best results have been obtained by the administration of massive doses. The second injection is generally followed by a very marked improvement, and it is rare that the disease has not yielded after the third or fourth injection. The serum has a very favourable effect on the duration of the disease, cure having been obtained in from three to six weeks, according to the gravity of the case.

Out of the twenty-eight horses treated with this method, twenty-four have been completely cured and returned to work.

4. Cremona gives particulars of a case of epizootic lymphangitis in a horse in which the characteristic lesions of the disease were localised in the posterior limbs. The clinical diagnosis was confirmed by microscopic examination of material obtained from the specific lesions. A slight degree of photophobia and lachrymation drew attention to the left eye. The lower eyelid was swollen, hot and painful, and there was a collection of muco-purulent material towards the inner angle of the

eye. On the inner part of the lower lid there was a red nodule, of the size of a grain of barley, containing a yellowish material. All the conjunctiva was infiltrated, and in its fold there were brownish-red granulations.

In addition to general treatment of the disease, the conjunctiva around the nodule, and the nodule itself, were touched lightly, daily and sometimes twice a day, with well-blunted crystals of sulphate of copper. A cure was effected in fifteen days.

5. The article by Boquet, Nègre, and Roig contains, with greater and additional detail, the subject-matter of previously published papers (see this *Review*, 1918, II. 445-447). In their experimental study they found that the period of incubation, to the time of the appearance of the initial ulceration, was from four to eight weeks. The only symptoms observed in the course of this phase was a fugacious cedema, which appeared immediately after inoculation and gave place to an indurated nodule, in which they describe alternations of extension and regression. In the fibrous nodule which appears at the point of inoculation small ovoid bodies, presenting the morphological characters of the cryptococcus, were found at the end of three or four weeks. These bodies were free in the serosity and multiplied by budding. Side by side with them were very rare round forms, with a double contour, identical with those present in cultures. When the nodules soften and suppuration sets in, cryptococci become numerous. They have then the characteristic form, with a double-contoured membrane and a mobile corpuscle in the hyalin protoplasm. At this stage all the organisms are within leucocytes. It is by phagocytosis that the cryptococcus gains the interior of the blood corpuscles. The leucocyte may destroy the parasite, but often the parasite multiplies within the blood corpuscle and stimulates the formation of a giant cell, by and by causing the decay of the cell-host. The cryptococcus comports itself as a parasite of the leucocyte, in the protoplasm of which it finds the albuminoids necessary for its nourishment. Along with the leucocytes the cryptococci gain the lymph stream, where they set up inflammatory processes by the action of their endotoxins. Afterwards they reach the lymph glands, which, momentarily at least, bar further progress.

The curative treatment, briefly indicated in a former paper, is here described more fully. The emulsion to be used for injection is prepared in the following manner:—One to two months' cultures of the cryptococcus are ground dry in a mortar, and then diluted with physiological saline solution in the proportion of 5 milligrammes of the culture to 1 c.c. of the saline. This emulsion is placed in sealed ampoules, which are heated for an hour at 62° to 64° C., the heating being sufficient to remove all pathogenic property. Injections are made

every eight days under the skin of the neck. The mode of treatment varies according to the case. (1) In mild cases, where nodules are few and recent, and where there is neither oedema nor visible lymph cords, the injections are given in increasing doses: 1 c.c., 2 c.c., 3 c.c., 4 c.c., 5 c.c. (2) In case of medium intensity, where the lesions date from fifteen days to a month, and where there are multiple cutaneous nodules not confluent and not connected by lymph cords, or scattered along a small and well-defined cord, the injections are: 1 c.c., 2 c.c., 3 c.c., 4 c.c., 4 c.c., 5 c.c. (3) In severe case, in which there is oedema, multiple, confluent nodules, large ulcerations, thick lymph cords, abundant suppuration, and secondary infection, the following doses are given at eight days' intervals:—0·5 c.c., 1 c.c., 2 c.c., 2 c.c., 3 c.c., 3 c.c., 4 c.c., 5 c.c. In all cases the dose of 5 c.c. should be repeated until a cure is effected, that is, until cicatrisation is complete in the external lesions, and the cords and deep nodules are absorbed. If, in the course of treatment, a persistent aggravation of symptoms is manifested, the initial dose should be reverted to, and the treatment proceeded with in progressive doses, as indicated above. Secondary infections should be met by the use of the polyvalent serum of Leclainche and Vallée.

In the horses treated by the authors, cure has been effected in from three to eight months, and in none of the cured animals has there been recrudescence of the disease. They are still under observation, and the future will show whether complete and definite sterilisation has been produced.

6. Boquet and Nègre summarise their latest paper as follows:—
(1) The subcutaneous inoculation of a culture of the cryptococcus causes the appearance of a nodule, which suppurates and is cured without generalisation. (2) Extension and generalisation of the primary lesion is provoked by reinoculation. (3) In an animal sensitised by the first inoculation, the period of incubation of the nodule of reinfection is shorter than that of the primary nodule. (4) Immunity is produced slowly in animals affected with naturally acquired or experimental epizootic lymphangitis, and is not complete until fifty days after the first inoculation.

7. Ruggerini concludes that, of all the forms of treatment that have been suggested for epizootic lymphangitis, the best results are obtained by surgical interference with the lesions combined with the use of antiseptics. He gives notes of ten cases in support of his contention. Even in cases that are held as incurable, a cure may be effected by the ablation of the lesions composed of masses of lymph glands in connection with the primitive localisation. It is not necessary to remove all the nodules that are peripheral to the engorged glands; the extirpation of tumefied glands causes the diminution in size of hard nodules and

arrests the production of new ones. The removal of lymph glands affected with slight inflammation is easy and without danger. For the sake of brevity, the author makes no mention of internal or general treatment, but considers that general tonic medication is of value. In animals in which the nutrition has been lowered, he gives good food associated with iodide, arsenical, and iron preparations.

TETANUS.

1. "Sulle forme locali di tetano nel cavallo siero-profilassato." P. PERRUCCI. *Il Moderno Zooiatro*. Parte Sci. Ser. V., Vol. VII, No. 11. November 1918. Pp. 225-236.
2. "Voie d'absorption de la toxine tétanique." F. ALBERT. *C. R. Soc. Biol.* Vol. LXXXI., No. 22. 7th December 1918. Pp. 1127-1130.
3. "The Isolation and Serological Differentiation of *Bacillus Tetani*." W. J. TULLOCH. *Proc. Roy. Soc. Lond.* Ser. B., Vol. XC., No. B626. April 1918. Pp. 145-158. 7 Diagrams. "On the Bacteriology of Wound Infections in Cases of Tetanus and the Identification of *Bacillus Tetani* by Serological Reactions." *Journ. Roy. Army Med. Corps.* Vol. XXIX., No. 6. December 1917. Pp. 631-661. 15 Tables.

1. Perrucci's paper contains the description of a case that illustrates the possible modifications (delay and localisation) in the manifestations of tetanus, induced by the administration of a dose of prophylactic serum.

On the 2nd February a horse was wounded by a nail piercing the right hind foot. Nothing was done at the time beyond the extraction of the nail. Six days later (8th February) the animal, being still very lame, was admitted into hospital. The wound being slight, no local treatment, other than the application of antiseptic dressings, was applied, but a prophylactic injection of 10 c.c. of antitetanic serum (Tizzoni) was administered.

On the 8th March, that is, thirty-six days after the infliction of the injury and thirty days after the injection of the serum, symptoms of local tetanus made their appearance in the injured limb. Marked contractions affected the whole limb and could be readily induced by touch and tapping. On the following day the symptoms were more pronounced; contractions could be easily induced; the limb remained in a state of hyperextension and was as hard as wood to the touch. Two days later tetanic manifestations appeared in the left hind limb, but these were not so pronounced as those of the injured (right) limb. The symptoms gradually extended to the back and abdomen, but there was no trismus or protrusion of the nictitating membrane, and there

was absence of any rigidity of the upper part of the neck. The position of the head was normal; the temperature, pulse, and respiration were not affected, and the general condition was good. The animal ate well, and defaecation and urination were normally performed.

A curative dose (25 c.c.) of antitetanic serum (Tizzoni) was administered subcutaneously. The case ended favourably, but the right hind limb did not regain its power and flexibility until about two months after the initiation of the disease.

[On post-seric tetanus, see A. Lumière, "Sur les té tanos post-sériques." *Ann. Inst. Pasteur.* 1917. XXXI. 20.]

2. From the results of his experiments, Albert concludes that the absorption of tetanus toxin is essentially by the blood-stream. Absorption by the nerves is of secondary importance. He considers that this view accounts for localised or delayed tetanus following the administration of serum.

3. Tulloch's investigations show that "more than one variety of (non-toxic) end-sporing bacillus, resembling *B. tetani* in morphological characters, can be recovered from wound exudate in cases of the disease. There are at least three different types of (toxic) *B. tetani*. . . . Culture in a selective medium, followed by agglutination of the washed growth in presence of the three-type sera, gives valuable information. It is, however, not so delicate a test for the presence of *B. tetani* as is animal inoculation after culture of the wound exudate."

RABIES.

1. "La diffusibilité du virus rabique." P. REMLINGER. *Ann. Inst. Pasteur.* Vol. XXXIII., No. 1. January 1919. Pp. 28-52.
2. "Immunisation du lapin contre l'inoculation sous-dure-mérienne de virus rabique fixe au moyen de cerveaux traités par l'éther." P. REMLINGER. *C. R. Soc. Biol.* Vol. LXXXII., No. 2. 25th January 1919. Pp. 52-54.
3. "Contribution à l'étude de l'immunité héréditaire contre la rage." P. REMLINGER. *C. R. Soc. Biol.* Vol. LXXXII., No. 4. 22nd February 1919. Pp. 142-144.

1. The greater part of this paper is occupied by a re-statement of experiments already reported in *C. R. Soc. Biol.* (see this *Review*, 1918, II. 35, 304-305). Is this property of diffusibility in certain fluids and certain organs, asks the author, capable of throwing any light on the debatable question of the actual nature of the rabies virus? At one and the same time, filtrable, diffusible, and capable of reproduction, it appears as though the virus should be regarded as intermediate between the visible microbes, which are at the lower limit of the

vegetable kingdom, and colloidal substances, which it may be permitted to place at the highest level of inorganic substances. The toxin of rabies has not an existence independent of the microbe, as is the case in diphtheria or tetanus. It is intimately a part of the constitution of the virus. According to the conception of Remlinger the rabies virus—a transition form between visible microbes and colloids, diastases, and toxins—resembles in a certain measure the *contagium virum fluidum* invoked by Beijerinck to explain the genesis of the disease of tobacco known by the name of "mosaïque"; but with a difference. The living fluid contagion ought to pass through filter candles whatever their degree of porosity, and ought not to be affected by centrifugation. But these two conditions are not complied with in the case of the virus of rabies.

If it is demonstrated that other invisible or ultra-microscopic organisms, other filtrable viruses, are also capable of diffusion *in vitro* and in organs, it will be possible to consider them also as bridging the gap between the bacteria and the diastases.

2. Having discovered that the brain of a rabbit dead of rabies loses its virulence when immersed in sulphuric ether for some hours, Remlinger injected forty-seven rabbits with from 100 to 1000 c.c. of emulsions of brains that had been in ether for variable periods. Fifteen days afterwards, the rabbits were inoculated subdurally with 0·25 c.c. of a $\frac{1}{50}$ th emulsion of *virus fixe*. In those cases in which the result was negative, the inoculation was repeated every one or two months with increasing doses of virus. Out of the forty-seven animals, sixteen (34 per cent.) did not react to the subdural inoculation. In thirty-seven, death followed the inoculation with a delay of one day (eleven cases), two days (four animals), three days (seven animals), four days (three animals), five days (two animals), and six, seven, nine, and ten days (one animal each). Of the sixteen immune rabbits, ten were still living at the time of writing this paper. The immunity had lasted for more than a year in all ten animals, and for nearly two years in one of them. The author believes that he may conclude that immunisation of the rabbit against subdural inoculation of *virus fixe* is easier to achieve than is generally supposed.

3. In his former experiments on the hereditary transmission of immunity in rabbits Remlinger has almost always obtained negative results. This is contrary to the experience of Konrádi in his work on the dog (*Centralbl. f. Bakteriol.*, I. Orig., 1917, lxxix. 80-82; see this *Review*, 1917, I. 468). Circumstances having been favourable, further experiments have been made, and, warned by previous experience that the male plays absolutely no rôle in possible transmission of immunity, the experiments were conducted with both father and mother in a state

of immunity, or with the mother alone immune. The results again were negative. In a certain number of cases there was absolute parallelism between the offspring of immune parents and the controls. It appears necessary to conclude, therefore, that the most completely immunised rabbits transmit only the lightest immunity to their offspring, and this is irregular and practically negligible. It does not follow, however, that hereditary transmission in the dog may not be susceptible of application.

A PRELIMINARY NOTE ON INFECTIOUS KERATITIS. J. A. ALLEN. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 307-313. 1 Figure.

Outbreaks of infectious keratitis in cattle have been reported as occurring in India, Holland, South Africa, the United States of America, and in the Western and Eastern Provinces of Canada. The present report deals with a small outbreak that occurred near Aylmer, Quebec.

The first case was attributed to injury, but, when a second case was reported a week later, possible infection was suspected. Six days later two other animals showed symptoms. The first symptoms were marked lachrymation, photophobia, and injection of the circumcorneal vessels and those of the conjunctiva. There was little constitutional disturbance. In a few days the pain became more intense, and the cornea took on a smoky haze, which started just below the centre of the cornea and ultimately spread over the entire surface. In four or five days the opacity became denser and vision was impaired. Signs of recovery now appeared in two of the animals, but in the others the infiltration became more dense. The opacity was now of a yellowish colour, and blood-vessels appeared in the marginal part of the cornea. A marked symptom was the appearance of small protuberances on the surface of the third eyelid. When last seen the more severely affected animals showed little improvement under treatment, and there was evidence of commencing ulceration.

The disease was reproduced by passing an infected swab over the conjunctiva of a healthy heifer. In six days there was intense lachrymation and photophobia, and in a few days the animal presented a typical picture of keratitis. Two days later other swabs were procured, and in eight days the disease was produced in a young bull. Similar experiments on rabbits and guinea-pigs were negative.

A diplobacillus with several of the prominent characteristics of the bacillus of Morax-Axenfeld, which is associated with human keratitis, were isolated and cultivated. The disease was not caused by instilla-

tion of a culture of the organism, which may be due to change or attenuation of the bacillus when grown on artificial media.

An abrasion of the eye is not an essential factor in the production of the disease. It is probable that it is usually conveyed by direct contact with an affected animal, or flies may play an important role in the dissemination of the disease.

IMPETIGO OF THE PIG. L. B. BULL. *Journ. Dept. Agric. S. Australia.*

Vol. XXII., No. 2. September 1918. Pp. 110-114. 1 Figure.

Queensland Agric. Journ. Vol. X., No. 5. November 1918.
Pp. 223-225. 1 Figure.

During the past two years a disease of young pigs has come under the notice of the Stock Department of South Australia, and although the disease does not appear to be very widespread, there is evidence to show that it is becoming more common. It appears to be more or less new to the State of South Australia, and is characteristically a disease of the skin. It occurs only in young animals, and usually appears at the age of two or three weeks, and rarely as late as ten weeks. Though it follows a more or less chronic course, the mortality is very high, death occurring in from one to three weeks after the first appearance of the skin lesions. The disease is very contagious.

The first sign of the disease is the appearance of small lesions, which may be irregularly scattered over the body, head, and limbs, but are most commonly seen on the belly, behind the shoulder, on the thighs, and on the under surface of the neck. A minute elevation of the skin rapidly enlarges and assumes a circular outline, with sharply defined margin. The lesion is raised and the skin in the centre becomes denuded of its superficial epithelium and covered with a crust. Later the epithelium hypertrophies and undergoes excessive keratinisation, so that a warty appearance is produced over the whole lesion except at its edge, which is clean, raised, and rounded. The lesions vary from those which are just visible to the naked eye to others 15 mm. or more in diameter. There is rarely any discharge, but sometimes there is a slight oozing of a straw-coloured fluid which rapidly dries. Cracks may appear and a purulent discharge develop. At first there is only moderate pruritus, but later the animals lose condition. Usually a diarrhoea sets in, lasts for a few days, and death occurs.

On post-mortem examination various internal organs may be discovered to be affected, but the same organs are not always attacked, nor are the appearances always the same. There is, therefore, no typical post-mortem appearance. There may be areas of consolidation in the lungs; the liver is usually mottled and covered with numerous

pin-point, whitish dots; the kidneys may contain petechiae, or they may show no haemorrhagic lesions but be much paler than normal; the mesenteric lymph glands are often very large and very haemorrhagic.

Bacteriological examination has resulted in the isolation of an organism, with the cultural and serological reactions of *Bacillus enteritidis* (Gartner), from the blood and tissues of the body, and, associated with staphylococci and streptococci, from the skin lesions.

The limited investigation which has been undertaken points to the disease as being due to inoculation of organisms into the skin, and experimental and field observations lead to the reasonable conclusion that lice are responsible for the inoculation. There is no evidence to show that the skin is inoculated by any other means, although there is no reason to believe that this is not possible. Only the soft and tender skin of the young appears to be susceptible, the harder and thicker skin of the old animal offering protection. It has not been possible to determine whether the fatal termination of the disease depends directly upon the presence of *B. enteritidis*, but the opinion is held that, given the absence of this bacillus, a milder type of disease would result, with few or no deaths.

MEDICINE.

EQUINE COLICS. W. J. MARTIN. *Amer. Journ. Vet. Med.* Vol. XIV., No. 3. March 1919. Pp. 111-114.

This paper is concerned only with impaction of the small and large intestine. The author has come to the conclusion that impaction of the small intestine is not common. When it does occur it is frequently found in the ileum and at the entrance to the cæcum. Impaction of the cæcum itself is of more frequent occurrence than is generally supposed. The majority of intestinal impactions—that is, faecal stasis and the conditions to which the stasis gives rise—occur in either the large or the small colon, and of these the large colon is most often the seat of the obstruction.

Overfeeding, feeding with innutritious foods, hard and prolonged labour, lack of proper exercise, slight or serious nervous derangements, and sudden climatic changes, are all causes of faecal stasis. Impaction of the large intestine often occurs in pregnant mares, and is then due to the pressure of the foetus upon the intestines. An insufficient supply of water may cause impaction, especially of the cæcum.

In obstructive colic the pains are less severe than in other forms of colic. The pulse is nearly normal; the temperature in the early

stages of the majority of cases is normal or nearly so, or it may be slightly subnormal; the visible mucous membranes are injected, and have a dirty grey, dry surface; the mouth is dry and hot, and the tongue is coated with a tenacious sticky mucus. In some cases there is irritation of the hinder parts and a desire to rub them violently. The animal frequently sits upon its haunches dog-fashion and backs into a corner or against the manger. Examination per rectum causes violent straining, and the mucous membrane of the rectum clings tightly to the arm. Some authors say that pressure of the overloaded intestine causes a desire to urinate. This, Martin thinks, is a misinterpretation of a symptom which is wholly due to pain. He considers that the stretching forward of the fore limbs as if to urinate is a characteristic symptom of impaction.

The main object in treatment should be the elimination of the offending material as soon as possible. Eserin or arecolin should not be given in the early stages. The author first applies intestinal lavage and massage, and has obtained good results. He prefers cold water in all seasons of the year, and adds ice to cool the water. An ordinary stomach tube and pump are used. The tube, hand, and arm are introduced as far as possible into the rectum, and an assistant works the pump. The hand is kept in the rectum during the whole time of the lavage, and, with the fingers closed, is used to apply gentle massage to the gut. The operation may be repeated in from two to four hours, or even earlier in urgent cases.

THE CAUSES OF LAMINITIS AND NON-TRAUMATIC "CORN" (Des causes de la fourbure et de la bleime non traumatique). E. BARRAT. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 321. September 1918. Pp. 433-438.

The author holds as insufficient the Boiteux-Siedamgrotzky theory of the displacement of the third phalanx following laminitis. This theory, stated briefly, stands as follows:—The laminar matrix, being destroyed or altered as a result of the inflammation, gives way under the combined pull of the flexor tendon and the weight supported by the limb, with the resultant descent and tilting of the third phalanx. This theory, the author contends, does not take into consideration whether the foot is normal or defective in shape, nor why the infection (now generally held to be the exciting cause) shows a predilection of the laminæ covering the anterior surface and the antero-inferior border of the phalanx. Any gross increase of the slope of the sole forwards and downwards—such as would occur when the heels are insufficiently pared, or the toes are too much pared—is considered necessary for

laminitis. Extra tension is thrown on to the antero-inferior laminæ, with the production of minute haemorrhages and exudations, these ultimately becoming areas of decreased resistance and local foci of infection.

The use of too high calkins, too thick quarters, and too thin toes, along with bad fitting of the shoe, are all conditions in which the laminæ at the toe are overworked. But, with the incidence of acute laminitis in such cases, relief may be obtained by appropriate general treatment and the correction of the exaggerated slope. If this is done, complications are avoided, and the disease will not become chronic.

The greater frequency of laminitis in the fore feet is ascribed to better paring of the heels of the hind feet and the consequent better development of the frog.

In brief, the first stage in the causation of laminitis is one in which in an improperly balanced foot, the shifting forward of the weight, along with the pull of the flexor tendon, throws extra tension on the laminæ at the anterior part of the foot. This leads to the next stage, in which there is the production of minute haemorrhages and exudations in the parts affected. Finally, there is opening up of a port of entrance for infection in these areas of lessened resistance. In cases recovering spontaneously with the correction of the balance of the foot by suitable paring and shoeing, the early stages have probably occurred, but infection has not had an opportunity to become established before the predisposing causes were removed.

"Corns" which cannot be attributed to mechanical causes (that is, "essential" or "non-traumatic corns") are held to be due to the same causes as those necessary for the production of laminitis. The tilting of the third phalanx causes a straining and laceration of the papillæ at the heels, between the wall and the bar. The movement here, however, being much less than at the toe—because the transverse axis round which the bone turns is behind the geometrical axis—less bruising results. To confute the theory that a separate ostitis of the angles of the third phalanx may have caused the "corn," the author points out that, the periosteum lying in direct continuity with the sensitive papillæ and laminæ, inflammation can readily spread from the latter to the former, while the etiology of laminitis, as stated, leads him to believe that inflammation of the covering laminæ occurs first, and periostitis and ostitis are secondary.

(W. C. M.)

ACUTE INDIGESTION IN CALVES. J. F. DE VINE. *Amer. Journ. Vet. Med.* Vol. XIV., No. 3. March 1919. Pp. 129-131.

The author has not found, in veterinary literature, a description of the condition he now discusses under the name of "acute indigestion."

He uses the name for lack of a better one, though, from a consideration of the symptoms, it might be called "reflex epilepsy." The condition is commonly seen in pure-bred herds of the Channel Island breeds. The symptoms are described in the following words:—"One of the finest and sleekest calves in the herd, varying in age from one week to three months, will suddenly refuse part or all of its milk, stand around or lie about stupid and listless for a few minutes to a few hours, either gradually or suddenly developing brain symptoms. Standing with its head pressed against the side of the wall or some hard object it will have a paroxysm of blattering, followed by all the manifestations of epilepsy—lying on its side, stiffening of the muscles, pirouetting of the eyes, champing of the jaws, frothing from the mouth, possibly emissions of faeces or urine, in some cases death following in a few minutes. Others finally relax, particularly if the case has received proper treatment early. The cases that relax may or may not be seized with subsequent convulsions. If the convulsions are repeated the termination is usually fatal."

Post-mortem examination usually reveals a mass of undigested casein in the stomach, all the other organs being normal so far as can be determined.

Death usually supervenes so rapidly that treatment is of no avail, but in one particularly large herd of Guernseys, where the disease caused the death of many calves, the author was able to obtain good results from the following treatment:—Immediately anything abnormal is observed, the calf is given a full dose of liquid peptonoid. This is followed in about twenty minutes by a pint of lime water, which in its turn is followed every half hour by from 8 ozs. to a pint of warm physiological salt solution. The treatment is repeated from two to six times, depending upon the case. An enema of warm water and oil is administered at the outset, and repeated several times during the day.

Seeing that the disease is most prevalent in breeds in which the solid content of the milk is unusually high, prevention is simple. Remove the calf from its dam twenty-four to forty-eight hours after birth, and dilute the dam's milk before giving it to the calf—1 part of warm water to 2 parts of whole milk.

INVESTIGATIONS ON SPECIFIC OPHTHALMIA. T. DALLING. *Vet. Journ.*
Vol. LXXV., No. 1. January 1919. Pp. 16-24.

A coccobacillus (referred to for convenience as the "nerve bacillus") has been isolated from the optic nerves of horses affected with specific or periodic ophthalmia. The organism is 1μ to 2μ in length by 0.5μ to 1μ in breadth. It very often occurs in pairs end-to-end, is motile, stains

well with any of the anilin dyes, is not acid-fast, but is strongly Gram-negative. It grows under either aerobic or anaerobic conditions, but best as an aerobe. Practically all ordinary culture media serve for its culture.

Numerous experiments have been made on both horses and laboratory animals, with varying results. The experiments, however, seem to indicate that, whatever part the bacillus plays in the production of specific ophthalmia, the best-marked results are obtained when the culture is of some age, that is, when an appreciable amount of toxin is injected. In some of the horses used in the experiments, conjunctivitis and iritis were induced by the intrajugular injection of cultures.

A vaccin made from agar cultures of the organism has been tried as a curative for the disease. Five cases of acute specific ophthalmia were selected, and a distinct improvement was noticed in each animal after the second dose of vaccin had been administered. In three of the animals the improvement continued and the eyes became absolutely normal. The author thinks that vaccin treatment is satisfactory, provided it is begun in the early stages of the disease.

Numerous agglutination tests have been made, and, from the results, it appears that animals affected with specific ophthalmia, and those cured of the disease, had developed an agglutinin capable of acting on the "nerve bacillus." Such a statement would almost make one justified in saying that the 'nerve bacillus,' if not *the actual cause* of specific ophthalmia, was at least *one of the causes*, probably acting with others."

SYMMETRICAL ALOPECIA IN BOVINES (*Alopecia simmetriche nei bovini*).

C. TAVONI. *La Clinica Vet.* Vol. XLI., Nos. 23-24. 15th-31st December 1918. Pp. 635-641. 4 Figures.

In the Central Cattle Depôt at Parma the author has encountered frequent cases of alopecia, to which he now draws attention. The cattle affected were almost all of the mountain breed, and had evidence of the condition on arrival at the dépôt. The hairless patches were most extensive on the neck, shoulders, and thighs, and were bilaterally symmetrical. The animals affected were both male and female, old and young, in poor condition, and with neglected skins. The early lesions were punctiform. They then spread in zones which ran centrifugally from the central nervous system in lines following the course of the peripheral nerves. Microscopic examination and experimental observation seemed to show that the condition was not parasitic.

The author inclines to find an explanation of the condition in bad feeding, indifferent hygiene, and exposure to marked variations in climatic environment.

FURTHER STUDIES ON "BRISKET DISEASE." G. H. GLOVER and L. E. NEWSOM. *Journ. Agric. Res.* Vol. XV., No. 7. 18th November 1918. Pp. 409-414. 3 Plates (7 Figures).

The authors have already (*Bull. No. 204*, Colorado Agric. Exp. Station, 1915) made a preliminary report on a peculiar dropsical condition found among cattle in the mountains of Colorado, which the stockmen call "brisket disease" from its most obvious symptom. They have now studied forty-five cases, more or less completely, and embody the results in the present paper.

Their observations show that normal animals living in a high altitude have a heavier heart than those living near the sea-level, and that animals affected with the so-called "brisket disease" have dilated, flabby, and heavy hearts. The blood contains a high percentage of red corpuscles. The affected animals show generalised oedema and enlarged and sclerosed livers, such as one would expect in cardiac weakness. Recovery generally takes place when the animals are removed to lower levels, but seldom if they remain at high altitudes. Animals from low altitudes are more often affected than natives, and calves sired by bulls from low altitudes are more likely to be affected than those sired by native bulls. The higher the altitude the more prevalent the disease. The food is not a factor in the production of the disease.

The authors, therefore, have no hesitation in concluding that the malady is due to failure of acclimatisation at high altitudes. "The remedy lies not in drugs but in breeding a hardier strain of cattle which can accustom themselves to the rigorous conditions incident to an existence at these extreme altitudes."

PARASITOLOGY.

PARASITIC MANGE.

1. "Dressing for Mange in Horses, Suggested by the Veterinary Department of the Board of Agriculture and Fisheries." *Journ. Board Agric.* Vol. XXV., No. 8. November 1918. P. 976.
2. "Sur la gale du cheval (tonte, coupe des crinières et queues)." BOUET. *Rev. Path. Comp.* Vol. XVIII., No. 149. October 1918. Pp. 4 (192)-7 (195).
3. "Traitement idéal des chevaux galeux." A. GUÉRIN. *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 511-512.

4. "Alcune osservazioni sulla cura della rogna sarcoptica negli equini." G. B. SCOTTI. *La Clinica Vet.* Vol. XLI., No. 19. 15th October 1918. Pp. 498-510.
5. "Contributo allo studio della cura della rogna." E. TORTI. *Il Nuovo Ercolani.* Vol. XXIII., Nos. 19-20. 15th-31st October 1918. Pp. 241-250.
6. "Compte-Rendu des expériences des 10 et 28 Septembre 1918 sur l'emploi des gaz sulfureux dans le traitement de la gale (Méthode Clayton)." H. ROSSIGNOL. *Bull. Soc. Méd. Vét. Pratique.* Vol. II., No. 8. October 1918. Pp. 209-219. 2 Figures.
7. "Le traitement de la gale par les gaz sulfureux avec quelques renseignements d'ordre général sur les acares, agents pathogènes de la gale des équidés, et sur les propriétés des diverses formes des gaz sulfureux." T. A. CLAYTON. *Ibid.* Pp. 227-236.
8. "Guérison de la gale par les gaz sulfureux." C. DEMORA. *Ibid.* Vol. II., No. 9. November 1918. Pp. 268-288. 2 Figures.
9. "Traitement de la gale des équidés par la cévadille." H. R. *Ibid.* Vol. II., No. 9. November 1918. P. 289.
10. "Un moyen pratique de diagnostic dans la gale des équidés." L. CAZALBOU. *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 10th October 1918. Pp. 403-404.
11. "La gale au front. Sa prophylaxie. Son traitement." FRANC. *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 24th October 1918. Pp. 440-446.
12. "Le camere a solforazione nella cura della rogna degli equini." F. FAVERO. *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VII., No. 12. December 1918. Pp. 241-257. 3 Figures.
13. "Note au sujet du traitement de la gale." GAY. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 324. December 1918. Pp. 635-640.
14. "De la cure d'air et de la guérison spontanée de la gale." DOUVILLE. *Rec. Méd. Vét.* Vol. XCIV., No. 21. 15th November 1918. Pp. 563-571.
15. "Les lésions microscopiques de la gale." R. SIMON. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 323. November 1918. Pp. 566-572. 5 Figures. *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 60-63. 5 Figures.
16. "Au sujet du traitement de la gale du dromadaire." G. CURASSON. *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 481-482.

17. "Una nuova sostanza parassiticida." G. AGNOLETTI. *La Clinica Vet.* Vol. XLII., No. 4. 28th February 1919. Pp. 109-114.

1. The Veterinary Department of the Board of Agriculture and Fisheries suggest the following lime-and-sulphur dressing for mange in horses:—

"A convenient quantity for a large establishment to make up at a time would be 9 lbs. lime and 18 lbs. sulphur. *Method of preparation.*—Slake the lime, and make into a thick paste with the sulphur. Place the mixture in a strong cloth, tie the ends, and suspend in a boiler containing 10 gallons of water, so that the water completely covers the contents of the cloth. The cloth must not touch the sides or bottom of the boiler, as otherwise the cloth may be burnt and its contents escape. Boil for two hours, then remove the cloth, taking care that none of the contents escape into the water, and throw the solids away. Make up to 10 gallons again with additional water, and put the liquid into a tight drum or barrel. *For preventire.*—Dilute the fluid with ten times the amount of water, i.e. 1½ pint of the fluid to every 2 gallons of water, and apply with a spray to all parts of the horse's body. *For affected horses.*—Dilute the fluid with eight times the amount of water, that is, 2 pints of the fluid to every 2 gallons of water, and apply with a spray to all parts of the horse's body. *Quantity used.*—Two gallons of the diluted fluid is sufficient to treat one large horse."

2. In connection with a communication by Roéland (*Rev. Path. Comp.*, June 1918, pp. 13-15; see this *Review*, 1918, II. 465) in which the clipping of horses in the treatment of mange is strongly deprecated, Bouet admits the disadvantages of clipping in winter. He points out, however, that the long winter coat hides cases of mange, prevents adequate grooming, and renders the application of lotions and other antisporoptic applications ineffective. As a compromise he suggests that, at least in suspected or infected units, all horses should be clipped *en chasse* (the hair of the limbs alone being left on) in the autumn, soon after the appearance of the long coat. In curative treatment clipping is a necessity, and complete clipping appears to be more rational than partial clipping. The mane harbours dirt, favours and hides harness galls, and covers that part of the neck in which the first evidence of mange often first becomes manifest. The hair should be cut from the root of the tail.

3. The note by Guérin is a *pendant* to a communication by Dieudonné (*Rec. Méd. Vét.*, 1918, xciv. 339; see this *Review*, 1918, II. 465), who related his experience of the spontaneous cure of mange in horses turned out to grass. Guérin's routine of treatment consists

in :—(1) Washing the horse all over with soap and water. (2) Placing him the next day for an hour at least in the sulphuration chamber and then turning him into the open, simple provision of shelter for the night and from wind and rain being provided. (3) Repeating the sulphuration two or three times at ten days' interval. He treats the head with a warm 2·5 per cent. cresyl solution or milk of lime and sulphur, applied twice a week.

4. Scotti relates his experience of the use, in cases of sarcoptic mange in horses, of a special preparation (the composition of which is not given) which goes by the name of *zoofitolo eubia*—a kind of pomade, dark in colour and viscid in consistence, which is rather a soap than an ointment. This is applied in the thinnest layer, scarcely sufficient to anoint the skin and the hair, without previous washing. The application is made daily for five days, and on the sixth the animal is thoroughly washed with warm water and soap, in order to remove the pomade. Because of its partial solubility, the preparation is much easier to remove than the usual fatty applications, and the first washing may be done with warm water alone. An extract of tobacco is now applied, and dried off with clean straw. During a ten-days' pause in the treatment a light daily application of tobacco solution (3 to 4 per cent.) prevents the possibility of re-contagion, kills newly hatched acari, and stimulates the skin. At the end of ten days, treatment with *zoofitolo* is repeated. Two series of treatment were generally sufficient, but in some cases it was necessary to give a third course six or seven days after the termination of the second. The author concludes that the preparation gives the best results, is perfectly innocuous, is tolerated in extensive applications to the whole of the body, and is rapid and certain in its effects.

5. Torti has sought to discover if there is any real specific for mange, or if one method of cure is preferable to another on the grounds of rapidity of action and economy in cost. The substances he has used are the following:—Creolin, carbolised extract of tobacco, hyposulphite of sodium and hydrochloric acid, a soapy solution of formol, alkaline sulphur soap, Helmerich's ointment, and mercurial ointment; that is, a group of watery solutions and a group of fatty preparations. All the horses treated were subjected to a preliminary clipping and a washing with 5 per cent. carbonate of sodium solution. Treatment was applied at intervals of four days between the first and second dressings, five days between the second and third, eight days between the third and fourth, and thirteen days between fourth and fifth.

He arrives at the conclusion that the great advantage of fatty dressings rests in their ability to remove crusts, and that they have no special acaricidal action. The same effect upon crusts could be obtained

by the use of any simple, inert fatty substance, such as vaselin or horse fat.

While all the watery solutions employed have the common disadvantage that they do not remove crusts: they appear to have only slight therapeutic differences. Hyposulphite of sodium and hydro-chloric acid cause excessive dryness of the skin, with a tendency to the formation of cracks. Carbolised extract of tobacco acts well and rapidly, and is among the cheapest of medicaments. Its acaricidal action is conspicuous. In some subjects there was evidence of the effect of absorption of nicotin, such as uneasiness, tremor, dyspnoea, acceleration of the pulse, and some diarrhoea, but these symptoms were of short duration. Alkaline sulphur soap has no special property setting it above the other medicaments, and it is not easy to apply. Creolin and soapy solution of formol are of equal value.

The point upon which the author lays special emphasis is the good effect of grooming. In two horses in which mange was recent and limited, a complete cure was effected by grooming only in the same space of time (a month and a half) in which cure was produced in animals treated with various medicinal substances. In two other animals, with adherent crusts which could not be removed by washing, unmedicated horse fat was used to remove the crusts, and a perfect cure was obtained twelve to fifteen days later.

6. Rossignol describes the generator and "hangar" used in the production and application of the "Clayton gas" in the treatment of parasitic mange in horses, and gives an account of the result of treatment in two groups of animals. The experiments were watched by a Committee of the Société de Médecine Vétérinaire Pratique.

7. Clayton claims that, by means of his apparatus, a certain proportion of SO_3 is mixed with SO_2 , and that by his method the greater part of the "gas" is absorbed automatically, uniformly, and rapidly by the skin of the animal, thus accounting for the radical destruction of all the acari and their eggs by a single treatment of two hours' duration. The fumes obtained by various forms of "sulfurogènes" and by burning sulphur in the open air, he contends, do not kill all the acari, and much less the eggs. He also criticises certain statements contained in a French Official Note issued on the 15th April 1918, in which it is said that the maximum efficacy of sulphur fumes is obtained at a temperature of 30° C. to 35° C., at which temperature the acari leave their burrows and become accessible to the acaricidal action of the sulphurous anhydride. Clayton asserts that the higher the temperature the less efficacious is the acaricidal action of the sulphurous anhydride. Since the higher the temperature the more rapid is the diffusion of the gas, the foregoing statement may appear paradoxical, but in the treatment

of mange it is not rapid diffusion that is wanted but strong absorption by the skin. The more the concentration of the gas is raised and the more its temperature is lowered, the greater and more rapid is its absorption.

Again, a temperature of from 30° C. to 35° C. will not tempt the females to leave their burrows, which are at a temperature of about 37° C. (that of the horse).

8. Major Demora contributes a long report on the Clayton method of treating mange with sulphuration. He lays emphasis on the fact that the combustion of sulphur in free air does not produce sufficient sulphurous anhydride to cure mange, and that the combustion of sulphur in a simply constructed apparatus transforms only 10 per cent. and sublimes almost all the rest. A simple apparatus, therefore, does not give certain results, for the reason that it does not produce a sufficiently high percentage of SO₂, and SO₂ by itself is not sufficiently toxic. It is necessary that the gaseous mixture should contain SO₃ in order to assure the complete destruction of acari, larvæ, and eggs. The gas must contain 3·5 per cent. of SO₂, and the temperature must not exceed 32° C. If these conditions are secured, a single sulphuration of one hour is sufficient to effect a radical cure of mange in the horse. Stress is laid on the necessity for the gaseous mixture to be at a temperature not too high, and that it should not contain an excess of SO₂, and much less of sublimed sulphur.

For the dressing of the head, Demora advocates sabadilla (cevadilla) prepared in the following manner:—

Powder or seeds of sabadilla	100 grammes.
Flowers of sulphur	60 "
Soft soap	25 "
Linseed or linseed meal	50 "
Water	1500 "

Dissolve the soap in 500 grammes of the water; emulsify the sulphur in the soap and water; add the sabadilla and linseed; add 1 litre of water and boil for fifteen minutes. Do not prolong the boiling, and avoid making the dressing too viscid by reduction of its volume.

After sulphuration the horse may be returned to work, but this should not be so heavy as to produce sweating during the forty-eight hours immediately succeeding the treatment. Nor should there be any grooming for two days. The first precaution is intended to avoid the elimination of the sulphurous gases (or their products) from the skin, in which they can be detected for three (sometimes four or five) days by the characteristic odour which is exhaled. The second precaution

is to prevent the recrudescence of dermatitis. The dermatitis generally disappears spontaneously during the eight days which succeed the sulphuration, but if it persists, it may be cured by one or two washings with a 3 per cent. solution of sodium carbonate.

9. *A propos* of the recommendation of sabadilla or cevadilla in the treatment of the head as an adjunct to sulphuration, in the preceding report by Demora, H. R. (Rossignol?) recalls that Tabourin, teacher in the veterinary school at Lyons, in his *Traité de Matière Médicale, de Thérapeutique et de Pharmacie Vétérinaires*, published in 1866, gives the following formula for an *infallible* antipsoroptic dressing:—

Sabadilla (cevadilla) powder	100 grammes.
Calcined alum	60 "
Flowers of sulphur	40 "
Olive oil	1 litre.

Digest in a water bath for one hour.

Petaux, who succeeded Tabourin at Lyons, gives the same formula in his *Agenda Vétérinaire du Vétérinaire Praticien*, which was published in 1897; as does also Neumann in his treatise on the parasitic diseases of the domestic animals. Since then this medicament, much praised of yore, has been forgotten.

10. Cazalbou (*Rec. Méd. Vét., Bull. Soc. Centr. Méd. Vét.*, 1918, xciv. 233; this *Review*, 1918, II. 465) has insisted on the great importance of the early diagnosis of mange by the detection of papules, and the pruritic response of the animal to scratching. He now describes how the detection of the papules may be facilitated by the use of clipping comb. This saves time, as a greater surface can be covered more quickly than with the fingers.

11. The prophylactic treatment, as advocated by Franc, consists of minute and daily inspection, the partial clipping of the neck, croup, and flanks, and the systematic application of an antipsoroptic dressing to all suspicious cutaneous lesions as soon as they are observed. For curative treatment he depends upon:—(1) General clipping of the whole body, so that the smallest lesions may be exposed. (2) The daily application of some antipsoroptic. For this purpose he uses a dressing consisting of grease, 10 parts; sulphur, 2 parts; carbonate of sodium, 1·5 part; and petroleum, 1·5 part. He completes the application by rubbing for two or three minutes with a bunch of dog-grass. The dressing is applied for four days in succession, and on the fifth day the horse is washed with soap and warm water. He avers that it is seldom a second treatment is necessary. The harness is always cleaned with soap, and the parts where dandruff accumulates are scraped with a knife or a piece of glass. These parts are afterwards dressed with the

antipsoroptic dressing. He claims for his treatment that it is simple, efficacious, and economical.

12. Favero describes a sulphuration "hangar" in which the treatment of parasitic mange is applied after the method of Clayton. He has used the treatment in about 500 cases, in the great majority of which one application for one to two hours, with a concentration of 3 to 4 per cent., was sufficient to effect a cure. In some instances it was necessary to give a second sulphuration, and in one case a third was required. He concludes that the method is ideal theoretically and the best in practice. It is efficacious, economical, and rapid, and almost entirely abolishes the mortality arising from mange infestation.

13. Gay's note contains a tabular statement of instructions to the personnel employed in the successive stages of the treatment of mange by sulphuration. He holds that the leather halter should be replaced by a hempen one, with a rope neither too long nor too short. While the horse is in the sulphuration chamber the leather halter should be disinfected with a solution of cresyl. Before the horse enters the chamber, wounds, cracks, and abrasions should be anointed with vaselin, and the mane and base of the tail should be clipped. The horses should be neither wet nor sweating when introduced into the chamber. The temperature of the chamber should not exceed 30° C. Once the requisite concentration of sulphurous anhydride has been obtained, the sojourn of the horses in the chamber should be an hour between 27° and 30°; an hour and fifteen minutes at 23° to 27°; or forty-five minutes only when the temperature is between 30° and 32°.

14. Douville criticises the conclusions arrived at by Bertin (*Rer. Gen. Méd. Vét.*, 1916, xxv. 531-539; this *Review*, 1917, I. 144) to the effect that parasitic mange may be cured by turning the affected horses out into the open. He does not doubt that the general condition of the animals is improved by being in the open air, but he is not of opinion that a cure is effected. "Under the influence of new atmospheric conditions and variations in temperature, the parasites do not enjoy a eugenic environment, and their reproduction is certainly retarded and diminished, but these physical factors . . . are insufficient to assure their destruction." As the result of his experience, Douville has arrived at the conviction that "the eyes must be at the tips of the fingers," that digital search for mange nodules is necessary, and that scratching the nodules is infallibly accompanied by the labial reflex.

15. Since the outbreak of war sarcoptic mange of the horse has been the subject of numerous communications, but Simon is not aware that the microscopic lesions have been described as they exist in generalised and chronic cases. He therefore removed pieces of skin from the base of the neck of two living horses affected with chronic and extensive

mange. The fragments were fixed in Bouin's fluid, sectioned, and stained with haematoxylin-eosin. The epidermis affected by the parasite was found to be much thicker than normal. The hyperplasia extended throughout all the layers of the epidermis, but it is noteworthy that the stratum granulosum, which is difficult to detect in the normal skin of the neck, consisted of several layers of cells. The stratum mucosum was infiltrated with numerous mononuclear leucocytes. The parasitic galleries in the stratum corneum were not arranged in any particular manner, and were bounded by horny laminae of new formation. The deeper galleries were between the stratum corneum and the stratum granulosum, with an upper wall of variable thickness formed by the stratum corneum, and a lower wall of remarkable thinness, composed also of horny material in contact with the stratum granulosum. In addition to ovigerous females ($500 \mu \times 300 \mu$) the galleries contained : (1) Ellipsoidal eggs ($200 \mu \times 125 \mu$), the youngest of which contained granular material that stained violet with haematoxylin; older eggs contained an embryo; and from the oldest eggs the larva had escaped. (2) Larvae ($220 \mu \times 140 \mu$). (3) Spherical, granular masses of excrement of brownish colour, and without any affinity for stains.

The dermis was thickened; the connective tissue bundles were separated by collections of embryonic cells and leucocytes; the superficial capillaries were dilated; and the deeper vessels had thickened walls and narrowed or obliterated lumina.

The external epithelial sheath of those hair follicles which were invaded by the parasite was in a state of hyperplasia and leucocytic infiltration similar to that observed in the general epidermis. The parasitic galleries were located in the external epithelial sheath, and never extended below the orifice of the sebaceous glands. This appears to be because the horny layer of the sheath stops at the orifice of the glands.

It appears that, contrary to the general conception, the larva, instead of coming to the surface of the skin to undergo development, may bury itself in the depths of the skin and remain there for a longer or shorter time; and thus, in the external sheath of the hair follicle, find shelter from the action of medicaments.

16. Curasson reports that sarcoptic mange in camels and dromedaries is a particularly serious disease because of the readiness with which it is propagated and the extreme emaciation which it produces. Harness galls are inevitable, and there may even be death from exhaustion. He has seen caravans in which almost all the animals were affected and in a state of emaciation bordering on cachexia. In hot climates fatty dressings are undesirable because of the rapidity with which they become rancid on exposure to the sun. This may lead to a veritable

vesication. The dressing with which Curasson has obtained good results is made in the following manner:—0·600 kilogramme of white soap, cut into thin shavings, is left in 1 litre of warm water for twenty-four hours in a closed vessel, and stirred from time to time. A paste is then made by the addition of 0·300 kilogramme of sublimed sulphur. Finally, 0·200 kilogramme of cresyl and 0·150 kilogramme of petroleum are stirred into the paste. The result is an almost liquid and very homogeneous paste which it is only necessary to stir at the time of using.

After clipping, a good layer of the paste is applied to the skin and rubbed in with the tips of the fingers. The next day some of the dressing will be found at the tips of the hair. This is again rubbed into the skin, without the addition of any more paste. The animal is then left for four days. On the sixth day it is only necessary to thoroughly brush the treated part with warm water, the soap in the preparation being sufficient to effect the cleansing of the skin.

17. Agnoletti claims good results from the use of a preparation consisting of thiometamethylene, 5 per cent.; sulphide of sodium, 5 per cent.; and soap excipient, 90 per cent. After clipping, the preparation is rubbed into the skin for fifteen minutes. It is left on for five days and then washed off.

TRYpanosomiasis.

1. "Sur le traitement des trypanosomiases animales au Soudan." G. CURASSON. *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 482-488.
2. "Symptômes nerveux et persistance des trypanosomes dans le liquide céphalo-rachidien de mules atteintes de nagana du *Trypanosoma brucei* var. *ugandæ*." G. DEGREEF. *Bull. Soc. Path. Exot.* Vol. XII., No. 1. January 1919. Pp. 17-21.

1. In various trypanosomiases in the horse, ox, and dromedary, Curasson has administered picric acid by the mouth in conjunction with the subcutaneous injection of atoxyl or the intramuscular injection of tartar emetic. The results have been so encouraging that he is induced to put them on record.

The dose of picric acid, gradually increased, was never greater than 10 grammes for the horse and 12 grammes for the ox and dromedary. Extract of opium was included in the bolus in which the picric acid was administered, and the bolus was given after food. None of the gastric intolerance sometimes observed in man was induced in the animals so treated. The horses always had a slight diarrhoea, in spite

of the opium; but the cattle and dromedaries were never so inconvenienced. The urine became coloured on the second day, but the author does not think that this was due to biliary pigment, for he applied Gmelin's test several times without obtaining the reaction. The mucous membranes and the sclera became yellow on the fourth or fifth day, and the colouration remained for a long time. The kidneys did not appear to be affected.

Of the two methods of treatment (atoxyl-picric-acid and tartar-emetic-picric-acid), atoxyl is to be preferred, because it is easier to administer than tartar emetic, though the two gave identical results.

2. The observations contained in Degreef's note were made during the operations of the Belgian troops in German East Africa from April to December 1916. Many mules were affected with trypanosomiasis, some with the parasite of the type *brucei* var. *ugandae*, others with trypanosomes belonging to the group *dimorphon-congolense*. Very often the infection was mixed. In the blood of the mules infected with *T. brucei*, short forms without free flagella, and with the nucleus towards the posterior extremity, were not rare. The different methods of treatment that were adopted were for the purpose of keeping the animals in a condition in which they could continue to work, rather than with a view to effecting a cure of the disease. Three of the twenty-five infected mules received five series of four injections of tartar emetic plus atoxyl. A fourth animal received four series of injection of tartar emetic and three series of orpiment. All four mules were infected with *T. brucei*; all died in spite of the treatment to which they were subjected; and all exhibited symptoms of cerebro-spinal disturbance.

In these animals a rapid examination of the blood made during fifteen days after the last treatment was negative, but the general condition of the mules did not improve. The appetite was indifferent and movement difficult. The temperature remained high (39° to 39.5° and even 40°). Suddenly the gait became unsteady and inco-ordination was noticeable. One of the animals had very marked paresis of the hind limbs, without loss of sensibility. This mule finally fell, failed to rise, and died after some hours of agony. In another animal there was a period of very pronounced nervous excitation. The condition lasted for three days, was accompanied by a temperature of 39.8° to 40.5° , and was followed by depression and coma.

In all the animals that died after treatment there were signs of cerebro-spinal infection, but post-mortem examination of three of them revealed no more than hyperæmia of the meninges, with some diffuse haemorrhagic infiltrations. Microscopic examination of the nervous tissue was not practicable. The cerebro-spinal fluid, much more

abundant than normal, and slightly cloudy, contained numerous trypanosomes. Inoculation of 1 c.c. of the cerebro-spinal fluid into a rat produced an acute infection that terminated fatally in fifteen days, and the subcutaneous injection of 5 c.c. produced a fatal trypansomiasis in a mule.

OBSERVATIONS AND EXPERIMENTS ON INTESTINAL TRICHINÆ. B. SCHWARTZ. *Journ. Agric. Res.* Vol. XV., No. 8. 25th November 1918. Pp. 467-482. 3 Figures.

Inasmuch as little is known concerning the physiological processes of *Trichinella spiralis* concomitant with their growth in the small intestine, it appeared to the writer of this paper that observations and experiments on the intestinal forms of the parasite, with special reference to their behaviour in various conditions, might yield some useful information. In nearly all the observations and experiments recorded in this article the parasites were obtained from albino or hooded rats that had been artificially infected by feeding with ground-up trichinous pork.

"The larvae of *Trichinella spiralis* do not linger in the stomach of the host after they are freed from their capsules, but pass into the small intestine. The passage of the larvae through the stomach does not stimulate them to further growth and development, and a brief sojourn in the intestine is insufficient to initiate those processes which lead to sexual maturity. Larvae from the intestine that have not yet been stimulated to further development become tightly coiled when removed from the host and placed in a physiological salt solution, but those which have been stimulated to development apparently lose the power of becoming tightly coiled under similar conditions. Larvae which have been stimulated to further development in the intestine will moult even after being removed from that organ. The moulting process may be hastened by high temperatures and suppressed by low temperatures. Larvae which have not yet been stimulated to further development in the small intestine cannot be caused to moult by a high temperature.

"With the beginning of development in the small intestine, the larvae lose the power of surviving for considerable lengths of time outside the host. They afterwards become more persistent, however, in direct proportion to their increasing age. When removed from the host within twenty-four hours after artificial infection, intestinal trichinæ often undergo spontaneous disintegration, which may be due to the sudden change of environment, lack of food, or possibly the liberation of toxic substances which affect the parasite while in an artificial medium.

" Larvae which moult after removal from the host have been observed occasionally to decrease in size. It is suggested that the dwarfed condition is possibly due to lack of food.

" After the first and subsequent moults the tolerance of the larvae to various toxic agents is replaced by a marked sensitiveness to such agents, which decreases, however, with advancing age. Under the influence of potassium cyanide the worms undergo disintegration, and exhibit susceptibility to the poison along the major axis, which in the growing forms appears to be greatest in regions where growth takes place most rapidly. Modifications in the permeability of the cuticle do not appear to be directly responsible for the changes in susceptibility. The changes probably result from a reorganisation of the protoplasm coincident with growth, differentiation, and age.

" Attempts to induce moulting in the larvae which have been decapsulated by artificial digestion and afterwards kept *in vitro* under various conditions have thus far failed to yield successful results."

RECENT EXPERIMENTS ON THE LIFE-HISTORY OF *ASCARIS LUMBRICOIDES*.

F. H. STEWART. *Brit. Med. Journ.* No. 3030. 25th January 1919. P. 102.

The present knowledge of the larval development of *Ascaris* is summarised. It is now known that the ripe eggs of the parasite will hatch in the intestine of man, the pig, rat, mouse, and guinea-pig, and that the larvae enter the blood-stream of the host. They pass through the liver and the heart to the lungs, there migrate from the capillaries into the alveoli, and thence through the bronchi and trachea to the pharynx. They reach the lungs and trachea between the sixth and eighth day after infection. In the mouse the larvae migrate from the pharynx down the alimentary canal and are passed alive but not active in the faeces from the tenth to the sixteenth day.

Stewart has recently performed three additional experiments on young pigs. " Two of these, A. and B., were four days old at the commencement of the experiment, the third, C., was aged two months and ten days. To both A. and B. a dose of about 22,000 ripe eggs of *Ascaris suilla* was administered, to C. about 50,000. The embryos in these eggs were moving actively, and the cultures were tested on rats and proved infective, larvae being subsequently found in the lungs. A. and B. suffered from ascaris pneumonia on the eighth day after infection; C. showed no sign of pulmonary trouble. Pig A. was killed on the fourteenth day, and young forms of ascaris, measuring between 2·5 and 3·8 mm., were found in great numbers in the small intestine and cæcum. Their heads had lost the appearance of the larval head and had taken on the adult head character. Pig B. was killed on the

nineteenth day, and although there can be no doubt that on the eighth day the lungs contained thousands of active larvæ, not a single worm was found in the stomach, small intestine, cæcum, or colon. The nature of the faeces found in the colon proved that the pig was not suffering from diarrhœa due to excessive infection, which might have accounted for the disappearance of the worms. Pig C. was killed thirty-one days after infection, and again no worms were found in the intestine."

The author admits that these experiments are puzzling. In the case of the pig A. the increase in the size of the worms to 3·8 mm., when the largest intestinal larvæ of the mouse measures 2·37, and in the lung of the pig 1·5 mm., and the assumption of the adult head character, are almost proof of direct development without an intermediate host. The disappearance of the worms in pig B. may or may not have been accidental.

[Recent papers on *Ascaris* infection have appeared as follows:—F. H. Stewart, *Brit. Med. Journ.*, 1916, ii. 5-7, 474, 486-488, 753-754; *ibid.*, 1918, i. 266; *Parasitology*, 1917, ix. 213-227; *ibid.*, 1918, x. 197-205; *Indian Med. Gazette*, August 1917. B. H. Ransom and W. D. Foster, *Journ. Agric. Res.*, 1917, xi. 395-398. Some of these have been abstracted in this *Review*, 1917, I. 33 and 340; 1918, II. 321.]

**A CONTRIBUTION TO THE KNOWLEDGE OF THE BOT-FLIES, *GASTROPHILUS INTESTINALIS* DE G., *G. HÆMORRHOIDALIS* L., AND *G. NASALIS* L.
S. HADWEN and A. E. CAMERON. *Bull. Entom. Res.* Vol. IX.,
No. 2. September 1918. Pp. 91-106. 1 Coloured Plate
(3 Figures). 10 Figures.**

The eggs of the three species of bot-flies discussed in this paper are distinguished by the fact that those of *Gastrophilus haemorrhoidalis* are stalked, while those of the other two species are stalkless. The eggs of *G. haemorrhoidalis* are also longer than those of the other two species, which are of about equal length. Further, they are brownish-black in colour, those of *G. intestinalis* being whitish-yellow, and those of *G. nasalis* yellow in colour. The average measurements of the eggs are given as follows:—*G. intestinalis*, 1·25 mm. in length by about 0·379 mm. at the widest part; *G. nasalis*, 1·25 mm. by 0·339 mm.; *G. haemorrhoidalis*, 1·5 mm. in length by 0·345 mm. at the widest part near the centre.

The eggs of *G. intestinalis* adhere to the hairs by clasping flanges which run only two-thirds of their length, while the eggs of *G. nasalis* have flanges that run almost their entire length.

The eggs of *G. intestinalis* are laid indiscriminately on the shoulders, mane, fore-legs, antero-interno-inferior part of the knee, and postero-internal region of the fetlock of the host; but the long hairs of the

inner side of the fore-legs appear to be especially favoured by the adults in ovipositing. The eggs have also been found on the hind-legs, particularly on the inside of the hocks, but here they are few in number. The eggs of *G. nasalis* are generally laid on the hairs of the intermaxillary space between the two halves of the mandible. Theobald and others are of the opinion that the species deposits its eggs in the nostrils, but this is not the experience of the present writers. *G. haemorrhoidalis* lays its eggs on the hairs of the lips, preferably the lower, and in no single instance was the egg found penetrating the skin. On the contrary, the egg was invariably found adhering to a hair and not touching the skin. Nor were eggs ever found in the nostrils.

The eggs of *G. intestinalis* do not readily hatch unaided, but apparently require moisture and friction or shock. A large number of *G. nasalis* eggs and a few *G. haemorrhoidalis* eggs hatched spontaneously. This is regarded as supporting the theory that the newly emerged larvæ of these two species may penetrate directly into the skin of the host. Lesions were observed on the skin of the intermaxillary space and lips, and these may be due to direct penetration of the larvæ of *G. nasalis* and *G. haemorrhoidalis* respectively. The newly hatched larvæ of *G. intestinalis* did not penetrate hair-bearing skin, but positive results were obtained when they were placed on portions of the buccal mucous membrane of a horse and calf recently killed. A larger number succeeded in penetrating the papillated part of the calf's tongue, as compared with the non-papillated.

Of the recently emerged larvæ, that of *G. intestinalis* is the largest, while that of *G. haemorrhoidalis* is the smallest. In these two species the number of body-segments is thirteen, while *G. nasalis* has only twelve and is the only species bearing slender, elongated hairs. The larval posterior spiracle of the latter species is sessile, whereas in the others the two spiracles are borne on the distal ends of two cylindrical processes arising from the ultimate abdominal segments.

The three species of bot-fly are probably present in each of the western provinces of Canada. In respect of seasonal appearance, *G. intestinalis* is somewhat later than *G. nasalis* and *G. haemorrhoidalis*, which appear simultaneously and are on the wing for about the same length of time (middle of July to the middle of August). *G. intestinalis* continues to be active far into the autumn. Of the three species, *G. intestinalis* causes the animal less apprehension than do the other two.

The provision of leather flaps on the lips of the horse, cut into strips, comb-wise, is advocated as likely to give good results in warding off the attack of *G. haemorrhoidalis*.

[For other references to the recent literature on the life-history of the bot-flies, see this *Review*, 1918, II. 469-471.]

NOTES AND EXPERIMENTS ON *SARCOCYSTIS TENELLA* RAILLIET. J. W. SCOTT. *Journ. Parasitology.* Vol. V., No. 2. December 1918. Pp. 45-60. 5 Tables.

In a former paper the author has produced evidence in favour of Darling's view that Sarcosporidia are merely aberrant varieties of Neosporidia of certain invertebrates. His experiments have been continued, and, in the present communication, certain facts are stated with reference to the time of year and other conditions under which infection does and does not occur. By using rigid methods of examination it has been found that apparently 100 per cent. of all adult range sheep are infected with sarcocysts. The animals concerned in the work here reported were raised under a variety of conditions; the experimental sheep were kept in a dry lot from the time of birth, were supplied with city water which came from deep springs, and were fed with baled native hay kept over from the previous season.

The sarcocysts varied considerably in shape, dependent chiefly on the location in the body, and partly upon the arrangement of the muscle fibres and connective tissue. For example, in the diaphragm the sarcocysts may be much elongated and of an approximately spindle-shaped form; while in the heart the typical sarcocyst is circular in cross section and approximately elliptical in longitudinal section. In early stages the length is usually several times the diameter, but later the diameter increases more rapidly than the length. As was to be expected, the older the lamb the larger is the sarcocyst.

The author summarises the chief points of his paper as follows:—

"(1) There is a well-defined seasonal infection of *Sarcocystis tenella* in the region of the Laramie Plains. It is not known whether this is true or not of other regions. Young stages of this parasite have been found in the muscles of both sheep and lambs throughout summer and early autumn, but not during the winter and spring.

"(2) Reinfection occurs in successive seasons, and old sheep are apparently as susceptible to infection as are young lambs. The theory (M'Gowan's) of infection *in utero* is untenable. Seasonal, self-reinfection is improbable, though not entirely excluded, and the evidence indicates the origin *de novo* of successive infections.

"(3) If a second host is required, which seems probable, it is very likely that this host is an insect, and that the definitive (sexual) stage of the parasite will be found here.

"(4) If a second host is not necessary, the sexual stage probably takes place in the intestine of the sheep, and in some unknown way the life cycle falls under the influence of seasonal control.

"(5) In old ewes the larger sarcocysts are not nearly so abundant

as the smaller ones. That some of the older sarcocysts do not grow to a large size is probably the most satisfactory explanation of this fact."

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PATHOLOGY AND BACTERIOLOGY.

A FREQUENT FORM OF INTERSTITIAL NEPHRITIS IN BOVINES (Di una forma frequente di infiammazione interstiziale a piccoli focolai nei reni di bovino). V. RONCA. *La Clinica Vet.* Vol. XLI., Nos. 23-24. 15th-31st December 1918. Pp. 616-636. 1 Figure.

The attention of the author has been drawn to the notable frequency of localised and characteristic lesions in the kidneys of cattle slaughtered in the public abattoir at Modena. The lesions appear on the surface of the kidney as rounded or oval areas, greyish-yellow or more rarely greyish-white in colour, varying in size from a millet seed or even smaller to the size of a pea or, at most, a hazel-nut. The areas are not depressed but may be slightly raised above the general surface. The capsule can be readily stripped from the surface of the organ, even over the lesions. On section, the lesions are found to have generally

a triangular outline, with the base towards the surface of the kidney and the apex directed towards the hilus. They are usually confined to the cortical substance, but in rare instances they may invade the medullary substance.

The lesions occur in animals of either sex, in good and bad condition of nourishment, and in healthy animals as well as in those affected with tuberculosis or distomatosis. That they are not associated with the tubercle bacillus is shown by the negative result of the inoculation of guinea-pigs with an emulsion of the lesions from tuberculous animals.

Microscopic examination shows that the pathological process begins as an infiltration of leucocytes and plasma cells in the neighbourhood of the glomeruli. The infiltration spreads in the intertubular stroma, and is followed by a fibroplastic proliferation. From the macroscopic as well as the microscopic characters, it appears that the process should be regarded as embolic in origin.

The condition is compared with the localised fibroplastic nephritis of calves, and the conclusion is that in both the young and the adult the interstitial inflammatory process is the same.

STUDIES IN BOVINE MASTITIS.

1. "I. Non-Hemolytic Streptococci in Inflammation of the Udder." F. S. JONES. *Journ. Exp. Med.* Vol. XXVIII., No. 2. August 1918. Pp. 149-167. 2 Tables.
2. "II. The Relation of Hemolytic Streptococci to Udder Infections." F. S. JONES. *Ibid.* No. 3. September 1918. Pp. 253-567, 3 Tables.
3. "III. Infection of the Udder with Micrococci and Other Micro-organisms." *Ibid.* No. 6. December 1918. Pp. 721-733. 3 Tables.
4. "IV. The Source of Infection in Streptococcic Mastitis." *Ibid.* Pp. 735-748. 9 Tables.

1. Jones undertook his investigations with the intention of defining more accurately the species of organisms responsible for disease of the mammary gland of cows, and if possible to lighten the burden imposed upon dairying by these affections. A more complete description of the biological characters of bovine streptococci obtained from inflamed udders appeared to be desirable for the purpose of assisting those interested in the public-health problem of milk-borne epidemics of tonsillitis. Much of the material has been obtained from a large dairy herd in which mastitis was more or less endemic.

In the examination of the milk obtained from eighty-one animals suffering from various forms of mastitis, the following bacterial asso-

ciations have been found:—Non-hæmolytic streptococci, thirty-one; hæmolytic streptococci, seventeen; mixed hæmolytic and non-hæmolytic streptococci, two; micrococci, twenty-four; *B. coli*, two; pleomorphic Gram-positive rods, four; *B. lactis aerogenes*, one. It was, therefore, obvious that non-hæmolytic streptococci were responsible for many udder infections, and it was decided to study several infections of this type. Data point to the extreme severity of these infections: of fourteen animals under observation for a considerable time but four have recovered. The others have either lost the function of the involved quarters or the disease has progressed to such an extent that they no longer remained profitable as milk producers.

The probable route of infection by non-hæmolytic streptococci is through the teat canal. The disease is local, only one or two quarters are involved, and the general condition of the animal is not affected. The author does not consider that previous injury is a predisposing factor in udder inflammation. Though it has been difficult to trace infection from one animal to another, the extreme irregularity of the occurrence of infection on the farm where a large proportion of the material was obtained may be explained by the transfer of the virus on the hands of the milkers. Cows with gross changes in one quarter and harbouring streptococci in apparently normal quarters, must be considered as dangerous virus reservoirs. Early cases eliminate streptococci before symptoms develop. Contamination of the end of the teat with faeces and vaginal discharge may explain other possible infections.

No definite evidence has been adduced to show whether the non-hæmolytic streptococci isolated from inflamed mammae are pathogenic for the consumer of milk.

In the cases studied, the lesions produced in the invaded quarters varied from an involvement of the lining epithelium only of the large milk ducts to severe degeneration and necrosis of the secreting epithelium. In one instance much of the glandular epithelium had been replaced by connective tissue.

When their action on the various carbohydrates are considered, the streptococci fall into two groups. "Thirty-four strains fermented dextrose, lactose, saccharose, maltose, and salicin; five others attacked the first four sugars but failed to produce acid in salicin. All mastitis streptococci failed to act upon raffinose, inulin, or mannite. One species isolated from a mammary abscess produced acid in all the carbohydrates. All the strains were agglutinated with an antiserum prepared from one typical strain. The agglutination titre varied over wide limits, although all the streptococci were agglutinated at a dilution of 1:500. None of the strains inoculated proved pathogenic for rabbits. A pig fed on the milk from two typical cases of mastitis remained well."

2. Although Jones, in his examination of sixty-one cows with mastitis, did not find haemolytic streptococci so frequently as those of the non-haemolytic type, nevertheless serious losses occur from these infections. Out of nineteen cows under observation for some time, eight had to be disposed of on account of the lesions involved, and in seven others the condition became chronic. Only four recovered. It appears that the mamma may be invaded at any time during the lactation period. Five of the cows developed mastitis shortly after calving. Although there is difficulty in tracing the infection, it seems possible that the principal channel of entrance is through the teat canal. Injuries play only a minor part as a predisposing factor.

It is remarkable that cows suffering from mastitis in one quarter associated with haemolytic streptococci frequently give out identical streptococci in the milk from the other quarters. Cows affected in this way are a source of considerable danger to other animals in the herd, for the milker, while aware of the infectious nature of the secretion from the diseased quarter, may be careless in handling milk from the apparently normal quarters.

"The development of mastitis in five cows shortly after calving is suggestive of infection with streptococci from the genital tract. Frequently one observes more or less discharge from the vulva of cows following parturition. In four of these cases mastitis developed in the right hindquarter; in the fifth both hindquarters became involved. The genital secretions after calving may readily run over the hind teats, and contained organisms in this manner may gain access to the teat duct."

"When the streptococci are classified according to their action upon carbohydrates, they fall into two broad groups: the larger consists of nineteen strains fermenting dextrose, lactose, saccharose, maltose, and salicin; and a smaller number, comprising ten species, produces acid in dextrose, lactose, saccharose, and maltose, and fails to ferment salicin. One of the non-salicin-fermenting strains did not attack saccharose. In no instance was acid production noted in raffinose, inulin, or mannite." With the exception of three, all the streptococci were agglutinated by an antiserum obtained from a rabbit immunised with a single strain. Freshly isolated cultures had but slight pathogenicity for rabbits.

3. Of eighty-one cases of mastitis studied by Jones, twenty-four were associated with micrococci; that is, apart from streptococci, micrococci have been the most frequent group of organisms isolated from inflamed udders. Various types of disease are produced by micrococci. Some of them give rise to only a mild catarrh of the larger ducts and milk cistern, while others produce more or less severe parenchymatous inflammation. On the whole, the prognosis is more

favourable in cases of micrococccic infection than in infection with streptococci; but cases of considerable severity have been attributed to staphylococci.

Micrococci similar in every respect to those associated with mastitis have been isolated from the normal udder. This has led Savage (*Report Med. Officer, Local Gov. Board*, 1907-08, xxxvii. 425) to question their true etiological significance. In many instances micrococci may gain access to the udder and produce slight disturbances that are entirely overlooked. Even more severe changes may follow infection. After recovery the organisms still remain in the milk, and the elimination of streptococci from the udder is observed even after apparent recovery from an attack of streptococccic mastitis. Doubtless in these cases the streptococci and micrococci would be classed as belonging to the normal flora. Even though micrococci do occur in supposedly normal udders, Evans (*Journ. Inf. Dis.*, 1916, xviii. 437) has shown that many are pathogenic for rabbits. The introduction of these organisms into the udders of non-resistant individuals might well give rise to more or less intense inflammation. The multiplication would doubtless be rapid until resistance had been established.

In two instances *Bacillus coli* has been isolated from cases of mastitis, and in another *Bacillus lactis aerogenes*. In four cases tiny motile Gram-staining organisms have been obtained in pure culture. Two of these have been identified as *Bacillus pyogenes*.

4. As the result of his investigation of the possible source of streptococccic infection, Jones concludes that, apart from clinical cases, the principal sources of infection are apparently normal cows which carry the virus in the udder. "These carriers may be grouped as follows:—(a) Those that have been infected recently and have not yet developed symptoms; (b) those that have suffered from inflammation of the udder and after recovery still harbour streptococci; (c) those that have no clinical history of mastitis. There is some evidence to lead one to regard the latter group as naturally immune." A milker may readily carry streptococci on the hands from an infected to an uninfected cow. A bacteriological examination was made of the vagina of sixty-four cows, and non-haemolytic streptococci were discovered in thirty-four; but of these thirty-two differed in their cultural characters and agglutination affinities from those associated with mastitis. The other two strains may be regarded as of etiological significance. Haemolytic streptococci have not been isolated from the vagina in a single instance. It must be remembered, however, that this may not be the case with all herds. "All the animals in this study cannot be regarded as normal individuals. A muco-purulent discharge from the vagina was observed in a considerable number of cows. Many had aborted. Others were

suffering from vaginitis or metritis. Retention of the placenta had occurred in several instances."

PHARMACOLOGY AND THERAPEUTICS.

THE COMPARATIVE VALUES OF SOME LOCAL ANESTHETICS. H. C. HAMILTON. *Journ. Lab. and Clin. Med.* Vol. IV., No. 2. November 1918. Pp. 60-68. 9 Tables.

This paper describes a series of experiments devised to test the relative values of cocaine, novocain, and apothesin as local anaesthetics. Though it has been admitted that novocain is somewhat less effective in practice than cocaine, the stability of this drug when heated to sterilise, and its lower toxicity, have made it second to none in its general applicability. A recent addition to the list of local anaesthetics is apothesin, which has proved to be a substitute for cocaine and novocain.

The results of the intracutaneous administration of the three local anaesthetics prove conclusively that (1) novocain is about one-half as efficient as cocaine, and (2) apothesin is practically equal to cocaine in anaesthetic value. Laboratory experiments, showing that both novocain and apothesin are inferior to cocaine when applied to the surface, are in agreement with clinical evidence which has demonstrated cocaine to be exceptionally rapid in its absorption from mucous surfaces. The comparative efficiencies of cocaine and novocain by intracutaneous injection also supports the opinion generally held that the latter is the less efficient.

"Based on the foregoing results it is evident that from every point of view apothesin is equal to or exceeds novocain as a local anaesthetic, and in some respects is not less efficient than cocaine."

POULTRY DISEASES.

A MYCOSIS OF TURKEYS. R. G. ARCHIBALD. *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 257-260. 4 Figures.

A poultry breeder in Nyasaland stated that many of his young turkeys had suffered from a disease in which lumps appeared on their heads and necks and occasionally on their knee-joints. The disease usually attacked birds between six days and seven months old, with a mortality of 75 to 85 per cent. Older birds were rarely affected.

In a specimen subjected to examination numerous nodules were present on the supra-, infra-, and inter-orbital regions, as well as on the lower surface of the mandible. In the inter-orbital region many of the nodules had coalesced. There were no lesions in the mouth. The nodules were of a creamy-yellow colour and fibro-caseous in consistency, firmly adherent to the skin, but not to the bone. Microscopic examination showed proliferation of the stratum corneum, and in some parts necrosis of this stratum. Between the stratum corneum and the prickle-cell layer there was extensive infiltration of leucocytes, plasma cells, round cells, and connective tissue cells. The prickle-cell layer was hypertrophied, and its more superficial cells were swollen, oedematous, and degenerative. A special feature of the cutis was a cell infiltration, in which plasma cells predominated. In the necrosed areas the Gram-Weigert method revealed dense masses of coccal bodies, morphologically resembling the spores of a fungus. Short of cultivation, it was not possible to say to what species of fungus they were related.

"The possibility of the condition being one of fowl favus or white comb, caused by *Lophophyton gallinarum* Matruhot and Dassonville, was considered, but the absence of the typical disc-shaped thick scabs, depressed in the centre, on clinical grounds alone ruled out this disease, while microscopically the histopathological changes and the absence of hyphal filaments formed further points in the differentiation from fowl favus."

SEROLOGY AND IMMUNOLOGY.

STANDARDISATION OF BLACKLEG VACCINE. L. W. GOSS and J. P. SCOTT. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 234-243. 8 Tables.

"Serum can be made from the horse, by injecting cultures of *B. chauvæi*, which will protect guinea-pigs from blackleg, when they are injected with 0·5 mil. of culture virus (10 mld.) if they receive 0·02 mil. of the serum fifteen hours previous to the injection of virus.

"Aggressins and filtrates in quantities of 2 to 5 mil. will produce an active immunity in eleven days, which will only protect 50 per cent. of the guinea-pigs when given 5 mld. of culture virus.

"A normal horse produced a serum which was capable of protecting guinea-pigs against 10 mld. of culture virus when injected with 0·5 mil. of the serum fifteen hours previous to the injection of the virus.

"The pathogenic properties of *B. chauvæi* cultures are greatly reduced by washing.

"Blackleg aggressins and filtrates have an aggressive action which seems to neutralise the protective action of serum."

SURGERY.

PYOTHERAPY.

1. "Essais de pyothérapie dans les suppurations diverses." G. A. CHANIER and DUPONT. *Rec. Méd. Vét.* Vol. XCIV., Nos. 15-17. 15th August-15th September 1918. Pp. 403-411.
2. "Pyothérapie. Son emploi en campagne. Considérations nées de l'expérience." FRANC. *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 469-481.

1. In their observations on pyotherapy in various suppurative conditions, Chanier and Dupont have employed pyovaccins prepared after the method of Velu (pus, 1 part; 5 per cent. phenolised physiological saline, 10 parts, with the addition of 15 per cent. of ether), and that of Belin (pus, 1 part; ether, 3 to 4 parts; and boiled water, 3 to 4 parts, added eighteen to twenty-four hours later). They have also used a modification of their own, consisting of an emulsion of 1 part of pus in 3 or 4 parts of boiled water, to which 3 or 4 parts of ether is added, with frequent shaking. This product is used the following day. They have tried both autogenous and heterogeneous pus, in some cases even taking the pus from the abscesses of epizootic lymphangitis.

The pyovaccin has been injected subcutaneously and into the jugular, with no clearly marked difference in the result. It appears, however, that the intravenous injection has its advantages, since the effect seems to be more rapid and complete, and there is less chance of local reactions, such as œdema and indurations. A daily dose of 2 c.c. of the pyovaccin has been used, two, three, or four injections forming the first series, according as the negative phase was established quickly or slowly. The second series of injections was started when the cure appeared to be slackening, which was in from eight to ten days on an average.

It is pointed out that during the negative phase there is spontaneous removal of dead tissue, which results in cleaning the wound, and obviates the necessity for surgical intervention. After the onset of the positive phase, suppuration rapidly diminishes and the pus loses its putrid character. Very fine granulations form speedily and regularly from the initiation of the positive phase, and cicatrisation sometimes proceeds with great rapidity. It appears to be all the same whether the pus has been obtained from the animal into which it is injected or derived from another animal. Pus taken from the abscesses of epizootic lymphangitis, prepared after the method of Velu, and preserved for several months, had apparently the same action as pus prepared extem-

poraneously, though towards the third month its activity seemed to be lessened.

The authors are careful to state that pyotherapy must be regarded as an adjuvant and not as a panacea. It is not possible to dispense with ordinary surgical procedures.

2. Franc gives a detailed account of his experience of the use of pyotherapy, and briefly relates its effect in twelve cases. He states it as his opinion that all wounds, whatever their origin, and whether they are primary or secondary, are amenable to pyotherapy. The method may have its weakness, but it is practical and economical, and can be carried out with little in the way of equipment. Some phials and a little ether is all that is required. Franc prepares the pus after the method of Belin, using three or, preferably, four volumes of ether to one of pus. Four volumes of cold boiled water are also added. He has used, without marked advantage, a preparation of 5 c.c. pus to 20 c.c. of iodin and iodide of potassium solution.

The writer has not found that large doses are more effective than repeated medium doses. Large doses (8 c.c.) may give satisfaction, but should not be continued. Medium doses (1·5 to 2·5 c.c.) produce a more regular development towards cure, and do not induce serious tumefaction of the region injected. If, for any reason, large doses are used, it is well that they should be given only every two or three days. Three injections are sufficient. Small doses may be administered every day for eight or ten days. It is an advantage to make the injections in series, with a few days' interval. Franc recommends that injections should be made in the neighbourhood of the lesions. He has observed that in horses in which there were numerous wounds or abscesses on the neck, those lesions nearest to the point of injection have been most favourably affected.

RHINOSTOMY: A NEW OPERATION IN CASES OF PARALYSIS OF THE NASAL DIVERTICULUM (Della rinostomia: nuovo intervento operatorio nei casi di paralisi delle false narici). F. CINOTTI. *Il Nuovo Ercolani*. Vol. XXIII, No. 22. 30th November 1918. Pp. 273-278. 2 Figures.

Paralysis of the "false nostril" is usually to be regarded as one of the symptoms composing the syndrome proper to paralysis of the seventh cerebral nerve. Functionally, however, the nasal diverticulum stands in only minor importance, in respect of lesions, as compared with the ear, eyelids, jaw, and lips; and it is only in cases of complete diplegia that lesions are of semiological value, and because of obstruction to respiration of preponderating importance. Nevertheless, paralysis of

the nasal diverticulum may exist alone, though certainly rarely as a unilateral lesion, and very rarely as a diplegia. The condition may be the result of traumatism.

The author has devised an operation whereby the obstacle to respiration (inspiration) produced by paralysis of the "false nostril" may be removed. The operation, for which the name *rhinostomy* is suggested, consists in the formation of a permanent opening into the diverticulum from the exterior. The animal is cast, a local anaesthetic and adrenalin is applied, and, from within, an incision of the lining of the diverticulum, 7 to 8 cm. long, is made so as to bisect the angle described by the free borders of the nasal and incisive bones, beginning about 2 cm. from the apex of the angle and passing forwards from this point. The inner lining of the lateral wall of the diverticulum is carefully freed by means of curved scissors. A similar incision is made through the external skin; the fibro-cartilaginous prolongation of the nasal cartilage (alar fold?) is liberated and amputated at its base, and the external skin and the inner lining of the "false nostril" are stitched together.

SOME OF THE OPERATIVE STEPS IN THE REMOVAL OF THE OVARIES OF
THE BITCH. J. P. FOSTER. *Amer. Journ. Vet. Med.* Vol. XIV.,
No. 1. January 1919. Pp. 13-15.

The writer devotes the first part of his note to the consideration of the position and length of the laparotomy incision. After pointing out the disadvantages of some of the locations recommended in text-books, he states that in his opinion "the incision beginning just posterior to the umbilicus is the most logical location for the opening in the mature animal. Little difficulty is experienced in locating the horns (of the uterus) at this point, and ordinarily the incision need not be more than an inch in length. The ovaries can be drawn out through the opening, and appropriate haemostasis applied to their attachments, without undue tension upon the horns. If the incision is well dilated, the intestines comparatively empty, and a good light obtainable, it often is possible to pick up and draw out the horns with a small hook, thereby making it unnecessary to insert the finger through the laparotomy incision."

In his experience a sound introduced into the vagina does not often enter the uterus; but the uterus can be located without difficulty when the end of the sound is in the anterior extremity of the vagina.

TUBERCULOSIS.

THE METHOD OF THE BUREAU OF ANIMAL INDUSTRY FOR TESTING THE POTENCY OF TUBERCULIN. E. C. SCHROEDER and G. W. BRETT. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 357-361.

The Bureau of Animal Industry now employ the following method to test the potency of commercial tuberculins. Guinea-pigs, practically alike in size, age, weight, variety, etc., are infected by the subcutaneous injection of tuberculous material prepared as follows:—"A small amount of fresh tuberculous tissue from a tuberculous guinea-pig (from 2 to 3 grammes) is triturated with a sufficient volume of sterile distilled water to make a smooth, semi-fluid paste. The paste is then thoroughly mixed with 150 to 200 c.c. of sterile distilled water and the resulting suspension filtered through ordinary filter paper." The amount of filtrate to be injected into the guinea-pigs is determined by the approximate number of tubercle bacilli contained. If, for example, microscopic examination of cover-glass preparations of the filtrate show one tubercle bacillus in each field, 0·25 c.c. is regarded as a sufficient dose; if only one or two bacilli are found on each cover-glass, 0·5 c.c. is used.

"Beginning about three weeks after the guinea-pigs have been infected, tests are made to determine the degree of sensitiveness to tuberculin which has developed. Two guinea-pigs are injected intra-abdominally, one with the equivalent of one cattle dose of tuberculin per 500 grammes of its weight, and the other with the equivalent of one and one-half cattle doses per 500 grammes of its weight. (The term cattle dose signifies the dose of tuberculin recommended for diagnosing tuberculosis in an adult bovine animal of average weight.)

"If both guinea-pigs survive, several days are allowed to pass and the same test is repeated on two more guinea-pigs. If the guinea-pig which received the larger dose died and the one which received the smaller dose survived, two guinea-pigs are injected daily with the smaller dose until the sensitiveness to tuberculin has developed sufficiently for both to die within a period of twenty-four hours. Following this day six guinea-pigs are given each the equivalent of one cattle dose of tuberculin per 500 grammes of weight, and if not less than four of the six die within twenty-four hours the remaining guinea-pigs of the number originally infected with tuberculosis are regarded as ready for use on the next day, on which the procedure is as follows:—As many groups of six guinea-pigs each, plus one additional group, are taken as there are samples of tuberculin to test, and to each group two normal, healthy guinea-pigs are added. Each group is used for one sample of

tuberculin and each guinea-pig is injected, intra-abdominally, with one cattle dose of tuberculin per 500 grammes of its weight. . . . To determine the sensitiveness of the tuberculous guinea-pigs a Bureau of Animal Industry tuberculin is used, which, in a previous test, proved to be of reliable potency. The plus group of guinea-pigs is injected with Bureau of Animal Industry tuberculin of presumably known potency, and is provisionally taken as a standard of comparison.

"Now, if the tuberculin which is provisionally taken as the standard kills not less than two-thirds of the sensitised guinea-pigs injected with it before the lapse of twenty-four hours, and the two normal guinea-pigs injected with it remain free from symptoms of disease excepting the rapidly passing distress which may immediately follow the injection, it is required that any other sample of tuberculin, if it possesses a reliable degree of potency, should kill, within twenty-four hours, at least half the sensitised guinea-pigs injected with it, and that the normal guinea-pigs injected with it should be alive and well at the end of twenty-four hours."

TUBERCULOSIS IN THE DOG.

1. "Riproduzione sperimentale della tubercolosi (umana e bovina) nel cane." C. SARTI. *La Clinica Vet.* Vol. XLI., No. 22. 30th November 1918. Pp. 579-597.
2. "Contributo alla casistica della tubercolosi del cane. Peritonite tubercolare in una cagna." A. MAGAZZARI. *Il Moderno Zootiatro.* Parte Sci. Ser. V., Vol. VII., No. 10. October 1918. Pp. 209-218.

1. Sarti has conducted experiments with a view to adding to our knowledge of the infection of the dog with tuberculosis. Material from a human source was administered by the mouth, while bovine tuberculous material was introduced by the mouth, intraperitoneally and intravenously. Infection by the digestive tract was effected with human material only, and only in two out of four animals to which it was administered. The author considers that his lack of success in the other animals depended upon the age and breed of the dogs made use of in his experiments. Young animals are much more receptive of tuberculous infection than are the old, notwithstanding the fact that tuberculosis is found with greater frequency in the old than in the young, because however many animals live more are exposed to contagion. Of the two dogs in which infection by the digestive tract succeeded, one belonged to a breed (fox terrier) that is held to be delicate. The other was only two months old. The uniformly negative result obtained by the administration, by the mouth, of tuberculous virus of bovine

origin demonstrated, contrary to the opinion of Chaussé, that the dog is more susceptible of infection from the human than from the bovine source.

The post-mortem lesions in these experiments show that tubercle bacilli, when introduced by the mouth, escape destruction in the stomach, traverse the mucous membrane and submucous tissue of the intestine without leaving any trace of their passage, and are carried by the lymphatics to the mesenteric glands. Thence they reach the spleen and liver, and, later, the lungs. The author does not discuss the point whether the bacilli, in their passage through the intestinal mucous membrane, produce no demonstrable lesion at all, or, producing a lesion, the lesion rapidly heals.

The lesions had the character of epithelioid cells, scanty leucocytic migration, no giant-cell formation, and no necrosis. These characters cannot be attributed entirely to the age of the lesions, but must be set down as due to some assumed organic peculiarity of the dog.

Tuberculous material of bovine origin produced positive results when introduced into the peritoneum or into the jugular vein, whatever the age or the breed of the experimental animal. Infection by the peritoneal route induced the formation of minute tubercles on the serous membrane. Then the retro-peritoneal glands and the intestine were invaded, and afterwards the liver and spleen. The organism then traversed the lymphatics of the diaphragm and reached the thoracic cavity. By the intravenous route the bacilli were diffused throughout the body and produced lesions in different organs.

2. Magazzari adds another to the already fairly numerous cases of naturally acquired tuberculosis in the dog. The case concerning which he gives full details occurred in an eight-year-old bitch. The prominent symptom during life was great distension of the abdomen caused by the accumulation of effusion, which interfered with the examination of the abdominal organs. On post-mortem examination the body was found to be almost entirely devoid of fat, the muscles were pale, but there was no haemorrhage, infiltration, or discolouration. The peritoneum was studded with numerous nodules of a size varying from that of the head of a pin to that of a pea. Some of the nodules contained caseous material; the contents of others were purulent; and some were undergoing calcification. The lymph glands were enlarged. None of the abdominal or thoracic organs presented evidence of tuberculous lesions.

Owing to the difficulties obtaining at the time, it was not possible to determine whether the bacillus was of the human or the bovine type. Despite the declaration of the owner of the dog to the contrary, the author inclines to the view that the dog had contracted the disease from a human source. The absolute absence of lesions in the respiratory

apparatus, and the exclusive localisation of the lesions to the mesenteric glands and peritoneum, seem to him to show that the bacillus had entered by the digestive tract.

THE USE OF GOLD SALTS IN THE TREATMENT OF EXPERIMENTAL
TUBERCULOSIS IN GUINEA-PIGS. XVIII. STUDIES ON THE
BIOCHEMISTRY AND CHEMOTHERAPY OF TUBERCULOSIS. LYDIA M.
DE WITT. *Journ. Inf. Dis.* Vol. XXIII., No. 5. November
1918. Pp. 426-437. 3 Tables.

The use of gold in therapy apparently dates back to the time of Abu Moussa Djafar or Geber, surnamed the Wise, who was born at Houran in Mesopotamia in the middle of the eighth century, and the use of gold in the treatment of tuberculosis is as old as the days of Paracelsus. Some of the details of the more recent observations on gold therapy in tuberculosis were given by Miss Lydia de Witt in an earlier paper abstracted in this *Review* (1918, II. 77). The present article supplements these details, and records the writer's experiments on the injection of auric cyanid, gold potassium cyanid, aurous cyanid, and aurocantan (cantharidyl-ethylenediamin-aurous-cyanid) into guinea-pigs experimentally infected with the human tubercle bacillus.

The conclusion to be drawn from these experiments is that the gold salts used are not efficacious in the treatment of experimental tuberculosis in guinea-pigs. There was a tendency to haemorrhage and hyperæmia in the gold-treated animals, and a marked shortening of life. Chemical analysis demonstrate that there is no specific affinity of gold for tuberculous tissues, and that the gold in the tissues is probably fixed in the tissue cells in such a form that it cannot inhibit the growth of the tubercle bacillus nor the development of the tubercle, even when its concentration in the tissues is much more than sufficient to cause complete inhibition in test-tube experiments.

REPORTS.

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION. THIRTIETH
ANNUAL REPORT. *Public Document No. 31.* January 1918.

During 1917 the Department of Veterinary Science (James B. Paige) was engaged in testing fowls for the detection of bacillary white diarrhoea, conducting investigations relative to *Bacterium pullorum* infection, and endeavouring to determine the value of serum in the prevention of swine fever.

The work bearing on the specificity of *Bacterium pullorum* antibodies, with special reference to the agglutinins, has been completed, and the results will be published in the near future. They furnish data for a comparison of the *B. pullorum* antibodies with those of the *B. coli-B. typhi-B. dysenteriae* group of agglutinins, and also furnish data for discussion of the diagnostic value of the agglutination test. The problem of the production of toxin by *B. pullorum* has proved very difficult, in that the determination of a uniform grade of toxin has been hard to obtain. The investigation concerning the production of antibodies, with special reference to the potency and rate of production, is being continued. At the time of writing the report a large number of birds, descendants of specially immunised individuals, were being observed.

The investigations on swine fever have for their object the determination of the value of antiserum in the production of immunity for the prevention of hog cholera, the best methods of application, and the development, potency, and continuance of inherited immunity.

Bound up with this Report is *Bulletin No. 181* (pp. 241-335), by J. B. Lindsey, C. L. Beals, and P. H. Smith, on "Digestion Experiments with Sheep."

ANNUAL REPORT OF THE IMPERIAL BACTERIOLOGICAL LABORATORY,
 MUKTESAR, FOR THE YEAR ENDING THE 31ST MARCH 1918
 (A. LESLIE SHEATHER, B.Sc., M.R.C.V.S.). Calcutta: Superin-
 tendent, Government Printing, India. 1918. Pp. 19. 5d.

The following figures, abstracted from the Report, indicate the results of the use of sera and vaccines:—

	No. of bovines which died uninoculated in course of disease.	No. of bovines inoculated.	No. of bovines which died after inoculation.	Percentage of deaths in inoculated bovines.
Rinderpest	67,565	497,747	1,925	0·38
Anthrax	2,018	10,817	29	0·26
Hæmorrhagic septicæmia (serum)	8,931	130,850	137	0·10
Hæmorrhagic septicæmia (vaccine)	296	50,406	9	0·01
Blackleg	166	9,435	40	0·42

REVIEWS.

FARMERS' CLEAN MILK BOOK. By CHARLES EDWARD NORTH, M.D., Director, North Public Health Bureau, New York City. London: Chapman & Hall. New York: John Wiley & Sons. 1918. Pp. xi. + 132. 5s. nett.

Of the many books that have been written concerning the production of clean milk there are not many, indeed very few, that find their way into the hands of those that most need them—the dairy farmers themselves. That the milk supply is sadly in need of improvement few will deny, and it will probably be accepted that the best results will be obtained by a judicious combination of education and legislation: of these two the former will be by far the more powerful weapon. It is, however, infinitely more difficult to educate than to legislate, and any scheme of education to be really effective must needs embrace both consumer and producer. Probably the former will require the greater and more careful attention, for not only does demand govern supply, but apathy, the fault of the consumer, is more difficult to remove than is ignorance, the cause of error in the producer.

The book under review, as its name indicates, is written for the producer, and, let us say straight away, that if it reaches the right quarters its publication will not have been in vain. The great majority of dairy farmers have neither the inclination nor the time to study laborious books containing a mass of detail, much of which is often of a controversial nature. There are not many books written expressly for the dairyman, but among such as there are, this one may be expected to take a premier place.

Dr. North states his facts concerning the production of clean and dirty milk, shows how faults can be corrected, and leaves it at that; there is no unprofitable preamble to send a man to sleep: the book is written to compel attention, and this it will assuredly do.

The thought is often expressed that it is impossible to produce clean milk in the type of byre at the disposal of our city cow-keepers, and that the palatial cow-house of the wealthy is indispensable before any improvement need be attempted. The author dispels any such illusion, and shows that the personal factor is, after all, the most important one, and who, after reading the *Test of the Ten Oxford Dairies*, can doubt that it is the man and not the material that governs the situation? We are, however, inclined to think that Dr. North pays too small a tribute to the very profound

influence of environment, and while "it is certainly true that a dairy farm producing milk containing millions of bacteria can in a single day, at practically no expense, change its methods so that the milk produced at the next milking will contain less than 10,000 bacteria per c.c.," we cannot admit that the destruction of the disgusting hovels within which much of our children's food is produced will be without profit to the mind of the dairyman and to the stomach of the child.

It is interesting to note that score cards find no favour with the author; he condemns them in no uncertain tones as being unjust to the farmers and laying too much emphasis on surroundings and too little on milk. He considers the score-card system to be "one of the most dangerous instruments in the dairy business." This will surely set some people thinking.

(R. G. L.)

MANUAL OF BACTERIOLOGY. By ROBERT MUIR, M.A., M.D., Sc.D., F.R.S., and JAMES RITCHIE, M.A., M.D., F.R.C.P.(Ed.). Seventh Edition. London: Henry Frowde and Hodder & Stoughton. 1919. Pp. xxiv. + 753. 16s. nett.

Though the scientist can scarcely be expected to regard the first edition of a text-book with that modified frenzy with which the bibliomaniac regards an *editio princeps*, much interest attaches to the comparison of the latest issue of a book such as Muir and Ritchie's *Bacteriology* with the first edition published twenty-two years ago. He who would gather some idea, however imperfect, of the rapid and notable advance of bacteriology during the past score of years, may spend a profitable hour turning over the pages of the first and seventh editions of a book which has deservedly gained the reputation of being among the best of its kind.

Since 1897, the year in which "Muir and Ritchie" first made its acquaintance with the printing press, bacteriology has undergone almost incredible expansion. The most perfunctory inspection of the index reveals a long list of references, the terms of which were uncoined, or newly coined, by the bacteriologist of the end of the nineteenth century. Problems relative to endotoxins, exotoxins, the chemical constitution of toxins, pleomorphism, "strains," the nature and significance of Negri bodies and their relation to the nervous symptoms of rabies, the relative sensitiveness of corresponding cells of different animals, the pathology of infections by piroplasmata—these, and many others, have confronted the bacteriologist during the period covered by the successive editions of the book now before us. Research on trypanosomiases may be said to have had its birth about the time the first edition was being written; for Bruce's work on tsetse-fly disease, which forms the starting-point of the present immense volume of highly important work on trypanosome infections, dates from 1894. Serology and immunology have developed into a most intricate and fascinating section of bacteriology, which now demands the exclusive service of a whole army of workers. The

Great War brought into prominence aspects of bacteriology that could not be shirked, but had to be faced without delay. Thus research was stimulated in a manner that can hardly be conceived as possible in time of peace.

But it is clear that in the space of a short review it is impossible to even begin to indicate the lines followed by bacteriology since 1897. Nor is this necessary. It is sufficient to say that, in their successive editions, Professors Muir and Ritchie have kept pace with current knowledge, and in their seventh edition they have incorporated all that is likely to be of service to the student and practitioner.

IMMUNE SERA. By C. F. BOLDUAN, M.D., and JOHN KOOPMAN, B.S.
Fifth Edition. Thoroughly Revised. New York: John Wiley & Sons. London: Chapman & Hall. 1917. Pp. viii. + 206. 7s. nett.

The little book by Bolduan and Koopman amply justifies its subtitle—*A Concise Exposition of our Present Knowledge of Infection and Immunity*—and may well be used as an introduction to a complex but highly important subject. That its reception at the hands of the physician and student has been gratifying to the authors is explained by the fact that five editions have been called for since 1907. In the present edition, we are told, there has been no change in either the scope or the plan of the book, but the entire material has undergone careful revision.

VACCINES AND SERA: THEIR CLINICAL VALUE IN MILITARY AND CIVILIAN PRACTICE. By A. GEOFFREY SHERA, B.A., M.D., etc. With an Introduction by Sir CLIFFORD ALBUTT, K.C.B., M.D., F.R.S. London: Henry Frowde and Hodder & Stoughton. 1918. Pp. xxi. + 226. 7s. 6d. nett.

Except for the enthusiastic few, veterinary practitioners have been reluctant to embark largely on the use of serum- and vaccin-therapy, and the medical man has latterly expressed himself much disappointed in the results obtained. Dr. Shera, in his little book on vaccines and sera, holds that, speaking broadly, medical opinion is deplorably chaotic concerning the subject; in some cases it is even hostile to certain lines of treatment; in many cases it almost ignores specific therapy. For this state of affairs he thinks the pathologists have only themselves to blame. "It is truly pathetic that specific therapy—one of the most brilliant and effective lines of research in modern medicine—and one has but to call to mind diphtheria in order to agree—is in parlous danger of being largely and notably discredited. Such is the case, and, I repeat, solely due to the fault of the pathologists themselves. What are these faults? I will not mince matters: undue optimism, due to lack of perspective, incoherency, intolerance of others' views, and commercial exploitation." Perhaps herein Dr. Shera is just a little unduly severe on what he would doubtless call the academic pathologist. Specific therapy is not old enough to be able to claim the

exactitude of mathematics, and much has been added of late to the knowledge of its limitations and complications. Sir Clifford Allbutt, in his Introduction, puts the present position in very reasonable terms:

"If I may judge of my brethren by myself, I should say that we are fairly sure that in vaccination great possibilities lie hidden; that if time after time its services are ineffectual, or even equivocal; or, again, if beneficent, yet rather by psychical than somatic influences, still, just when perhaps we are least sanguine, a few successes appear so decisive for good as to lead us back to the conviction that if we have often failed with this potent instrument—potent for evil as for good—it is because we are as yet far from understanding the use of the weapon; if some of our blows take effect, others beat the air, and some indeed do damage to our own side."

It has to be remembered that it is within very recent years that the bacteriologist has been led to recognise that what is apparently the same disease may be induced by different strains of organisms. Dr. Tulloch quite recently demonstrated three types of *B. tetani* (see this *Review*, 1918, II. 244) which are toxic; while there is more than one strain which is non-toxic. It can be readily understood that the single antitoxin which is used against tetanus might not be of absolutely equal efficacy in all cases, dependent upon the strain of toxin against which it is called upon to act. Tetanus of itself would furnish an admirable text for a discussion of the complexities and intricacies of specific therapy. Among other things, it would afford an excellent example of the modifications introduced into a disease by the use of prophylactic serum. Formerly there was tetanus with initial trismus; now there is also modified (delayed and local) tetanus.

To quote Sir Clifford Allbutt once more:

"Whereas once when we had attached a species of microbe to a certain disease we were satisfied, we are now learning that . . . we are dealing not with one kind or variety only, but perhaps with three or four, each requiring its own antidote, and refusing to yield an inch to antidotes which are effectual for others with but a shadow of difference from them. Not only so, but, again, in respect of any one variety we may have to deal with an endotoxin, or with an exotoxin, or with both together; and so need in the several cases a vaccin or a serum, or again a combination of the two. . . . Then, again, there are tides of virulence almost amounting to differences of kind, or, conversely, a microbe adapts itself to the antibodies of its host, so that a vaccin from a new strain of the microbe must be brought in, or, in another sense, as in the case of carriers, the host becomes tolerant of its parasite. Besides, as Dr. Shera points out, microbes from different localities often present variations of quality which find their results in deviations of effects. Furthermore, from such researches as those of Professor Adami, and latterly those of Dr. Hort (see this *Review*, 1917, I. 397), it may

appear that not a few germs have each two distinct phases—one obvious, the other obscure or even ultra-microscopic—the former overshadowing the latter in such a way as to leave the obscure phase, previous to these researches, undetected. This appears to be the case in typhoid fever, in swine fever, and in cerebro-spinal meningitis."

Though written from the point of view of human medicine, Dr. Shera's book contains so much matter dealing with the general principles of specific therapy as to make its perusal well worth the while of the veterinary reader who may be somewhat less familiar with the subject than he could wish.

NOTES ON BOOKS.

AN INTRODUCTION TO THE STUDY OF BIOLOGICAL CHEMISTRY. By S. B. SCHRYVER, D.Sc.(Lond.). London and Edinburgh: T. C. & E. C. Jack. Pp. 340. 6s. nett.

In his preface the author makes no claim to have dealt with more than one part of the study of biological chemistry, namely, that concerned with the structure of materials of which the bodies of living objects are composed. "In many parts this book does not differ markedly from an elementary text-book on organic chemistry. . . . Furthermore, an attempt has been made to indicate the methods by means of which the branch of chemical science known as organic chemistry may be applied to biological research. . . . Other branches of biochemical investigation can only be studied satisfactorily by those who possess a good fundamental knowledge of physical chemistry; the discussion of them has been entirely omitted from this book."

HANDBOOK OF PHYSIOLOGY. By W. D. HALLIBURTON, M.D., LL.D., etc., Professor of Physiology, King's College, London. Fourteenth Edition (being the twenty-seventh edition of *Kirke's Physiology*). London: John Murray. 1919. Pp. xx.+936. 16s. nett.

When an already famous book passes into a new edition in something less than two years (we reviewed the thirteenth edition of *Halliburton's Physiology* in November 1917), it is clear that little remains to be said in respect of its utility or acceptance. Naturally, the present edition is practically a reprint of its predecessor. In the words of the author, "the numerous small improvements and additions now introduced are mainly the result of suggestions by kindly reviewers." In these days of revival of physiological study, it will be interesting to see how long the present edition will last. It is safe to predict that it will not be long before a new edition is called for.

AN INQUIRY INTO THE MEDICAL CURRICULUM BY THE EDINBURGH PATHOLOGICAL CLUB. Edinburgh: Wm. Green & Son. 1919. Pp. iv.+512.

The Edinburgh Pathological Club carried out during Session 1917-18 an inquiry into the medical curriculum. The papers, with a *résumé* of the

discussion and the final report adopted by the Club, were published in the *Edinburgh Medical Journal* 1918-19, and are here collected for issue as a separate volume.

THE QUANTITATIVE METHOD IN BIOLOGY. By JULIUS MACLEOD, Professor of Botany, University of Ghent. London : Longmans, Green & Co. 1919. Pp. xii. + 228. 15s. nett.

The aim of this book is to suggest the establishment of "constants" in biological science, similar to the methods of measuring and expressing the properties of substances and objects in chemistry, physics, and mineralogy.

A CENTURY OF SCIENCE IN AMERICA. By EDWARD SALISBURY DANA and Others. New Haven : Yale University Press. London : Humphrey Milford. 1919. Pp. 458. 17s. nett.

In commemoration of the hundredth anniversary of the institution of the *American Journal of Science*.

MEDICAL BACTERIOLOGY. By JOHN A. RODDY, M.D. Philadelphia : P. Blakiston's Sons & Co. 1918. Pp. xi. + 285.

INTRAVENOUS INJECTION IN WOUND SHOCK. By Professor W. M. BAYLISS. London : Longmans, Green & Co. 1918. Pp. xi. + 172. 9s. nett.

ROENTGEN TECHNIC (DIAGNOSTIC). By NORMAN C. PRINCE, M.D., Omaha, Nebraska. London : Henry Kimpton. 1918. Pp. 142.

A MANUAL OF X-RAY TECHNIC. By ARTHUR C. CHRISTIE, Major, U.S.M.O.R.C. London and Philadelphia : J. B. Lippincott Co. 1918. Pp. 152. 12s. 6d. nett.

PHARMACY, THEORETICAL AND PRACTICAL, INCLUDING ARITHMETIC OF PHARMACY. By Professor E. A. RUDDIMAN. London : Chapman & Hall. 1917. Pp. vi. + 267. 9s. 6d. nett.

THE GRASSES AND GRASSLANDS OF SOUTH AFRICA. By Professor J. W. BEWS. Pietermaritzburg : P. Davis & Sons. 1918. Pp. vi. + 161. 7s. 6d. nett.

A TEXT-BOOK OF BIOLOGY FOR STUDENTS IN GENERAL, MEDICAL, AND TECHNICAL COURSES. By Professor W. M. SMALLWOOD. Third Edition, Enlarged and thoroughly Revised. Philadelphia and New York : Lea & Febiger. 1918. Pp. xiv. + 306. 10s. 6d. nett.

LEHRBUCH DER BAKTERIOLOGIE MIT BESONDERER BERÜCKSICHTIGUNG DER
UNTERSUCHUNGSMETHODEN, DIAGNOSTIK, UND IMMUNITÄTSLEHRE.
VON L. HEIM. 5te Auflage. Stuttgart: Enke. 1918. Pp. 605.

A MANUAL OF ELEMENTARY ZOOLOGY. By L. A. BORRODAILE, Lecturer
in Zoology in the University of Cambridge. Second Edition (with
Additions). London: Henry Frowde and Hodder & Stoughton.
1919. Pp. xiv. + 616. 16s. nett.

THE ORIGIN AND EVOLUTION OF LIFE. By Professor H. F. OSBORN.
London: G. Bell & Sons. 1919. Pp. xxxi. + 322. 25s. nett.

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[A note on a paper under this heading does not preclude a fuller abstract in a later issue.]

ANATOMY

(Including Embryology and Histology).

BELLI, F. "Ratio of the Weight of the Cerebrum and Cerebellum to the Frontal Diameter of Bovines" (Peso del cervello e cervelletto dei bovini in rapporto ai diametri frontali). *Il Nuovo Ercolani*. Vol. XXIV., No. 4. 28th February 1919. Pp. 38-42.

BLAND-SUTTON, J. "Gizzards and Counterfeit Gizzards." *Lancet*. Vol. CXCVI., No. 4930. 8th February 1919. Pp. 203-206. 7 Figures.

BROMAN, I. "The Vitelline Vessels of the Horse" (Über die Vasa vitellina beim Pferde). *Anat. Anz.* Vol. LI., Nos. 19-20. 30th December 1918. Pp. 465-480. 6 Figures.

FOSTER, J. P. "The Lymphatic System." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. Pp. 587-591.

HOPKINS, L. T. "Superfætation in the Bovine." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. P. 622.

In a shorthorn cow, about eight years old, killed at an abattoir, the right cornu of the uterus contained a foetus about nine or ten months old, while in the left cornu there was an embryo of about three months' development.

HUNT, R. H. "Variability in the Common Carotid Arteries of the Domestic Cat." *Anat. Record.* Vol. XV., No. 5. December 1918. Pp. 217-219. 5 Figures.

MONTANDON, L. "The Total Volume of Erythrocytes and Leucocytes in the Blood of the Horse as Shown by the Hæmatocrit" (Recherches

sur le volume total des érythrocytes et leucocytes dans le sang du cheval à l'aide de l'hématocrite). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 2. February 1919. Pp. 57-81.

CLINICAL.

ARMFIELD, J. M. "Dropsy of the Uterus in a Ewe." *Vet. Record.* Vol. XXXI., No. 1579. 15th February 1919. P. 282.

CINOTTI, F. "Fracture of the Greater (Lateral) Tubercl of the Humerus : Tenotomy of the Infraspinous Muscle" (Frattura del trochitere : Tenotomia del retrospinoso). *Il Nuovo Ercolani.* Vol. XXIV., No. 4. 28th February 1919. Pp. 33-37.

GRIFFITHS, J. A. "Clinical Cases (Dogs)." *Vet. Record.* Vol. XXXI., No. 1594. 25th January 1919. P. 258.

Two cases. One was traumatic rupture of the abdominal wall, with extrusion of the mesentery and a small portion of the intestine. The second case was that of an abscess in the right flank, containing a portion of the scapula of a fowl.

HARVEY, F. T. "A Clinical Complex—Relapse in Milk Fever." *Vet. Journ.* Vol. LXXV., No. 2. February 1919. Pp. 61-63.

"The case is remarkable on account of the variety of clinical conditions met with in a comparatively brief illness. Summarised, they are as follows :—(1) Milk fever with relapse ; (2) loss of power in limb ; (3) torsion of uterus ; (4) delayed birth and uterine inertia ; (5) foetal dystokia ; (6) retention of membranes ; (7) mastitis ; (8) bronchial catarrh."

— "Gas Gangrene." *Vet. Journ.* Vol. LXXV., No. 2. February 1919. Pp. 63-65.

Describes a case in a fourteen-year-old horse. The chief characteristics of closed gas gangrene as met with by the author are :—(1) The sudden onset ; (2) the large but well-defined swellings ; (3) the tension under which the gas has been confined ; and (4) the large amount of necrosed tissue ultimately thrown off.

— "Submaxillary Cellulitis in Cattle." *Vet. Journ.* Vol. LXXV., No. 2. February 1919. Pp. 65-67.

A typical case is described as occurring in a six-year-old cow. The author has met some five or six such cases, mostly in adult animals. "There has always been the same rapid spread down the channel of the neck, and infiltration

tion of the tissue with foul-smelling, greyish-looking pus. Extension is most rapid along the length of the muscles, and may travel from the angle of the jaw to the sternum in a few hours. Each case has improved following free incision and drainage."

HOARE, E. W. "Interesting Case of 'Infective Sarcoma,' Involving the Heart, Esophagus, and Trachea." *Vet. News.* Vol. XVI., No. 790. 22nd February 1919. Pp. 62-63. 1 Figure.

The condition occurred in a fox terrier dog, aged five years.

LENZI, F. "A Case of Heart Disease with Complications in the Horse" (Di un caso di vizio di cuore combinato nel cavallo). *Il Moderno Zootiatro.* Parte Sci. Ser. V., Vol. VII., No. 12. December 1918. Pp. 257-264.

MORGAN, E. "Tetanus of a Cow following Retention of the Placenta." *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 29-31.

Tetanus is prevalent among horses and mules in Venezuela, but this is the first case the writer has seen in cattle. The owner of the cow was carting surface earth, and almost every day made an attempt to remove the placenta. He used no antiseptics whatever for the hands.

OXSPrING, G. E. "A Peculiar Case of Shoulder Lameness." *Vet. Record.* Vol. XXXI., No. 1600. 8th March 1919. Pp. 305-306. 1 Plate (2 Figures).

"At the post-mortem examination a bony growth was found on the cartilage of prolongation (scapular cartilage), near the cervical angle of the scapula. The enlargement was nearly circular in outline, with a diameter of 3 ins., and it extended through the depth of the cartilage; the remainder of the latter was quite normal."

PAYNE, A. "A Remarkable Fracture." *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. Pp. 451-452.

Serious fracture of both sides of the pelvis. "The pony was a fairly well-known trotter and, the owner being away, his man was exercising him in a light governess car. He informed me that the pony was going at the rate of 10 or 12 miles an hour, when he went suddenly dead lame."

"Jaundice in the Dog." *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. Pp. 452-453.

"Interesting Case of Sand Colic." *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. P. 454.

ROY, G. "Fracture of the First Phalanx of a Horse" (Fracture de la première phalange du membre antérieur droit sur un cheval de cinq ans). *Bull. Soc. Méd. Vét. Pratique.* Vol. III., No. 1. January 1919. Pp. 12-14.

A five-year-old horse fractured the first phalanx of the fore limb while galloping. The fracture healed in a month. The treatment consisted in the application of a thick bandage.

SANI, L. "The Treatment of Suppurative Otitis with Polyvalent Antipyogenic Serum" (Sulla terapia delle otiti suppurate col siero anti-piogeno polivalente). *Il Nuovo Ercolani.* Vol. XXIV., Nos. 1-2. 15th-31st January 1919. Pp. 5-11. *Ibid.* No. 3. 15th February 1919. Pp. 19-23.

SCOTT, W. "Actinomycosis in a Mare Treated with Auto-Vaccino-Therapy. Recovery." *Vet. Record.* Vol. XXXI., No. 1593. 18th January 1919. Pp. 241-243.

"The excellent responses obtained by auto-vaccination in this case gives encouragement for future effort along those lines, particularly in those obstinate cases where the iodin treatment has failed to give results."

TUTT, J. F. D. "Epithelioma of the Penis in a Pony." *Vet. Record.* Vol. XXXI., No. 1600. 8th March 1919. P. 306.

In an aged pony, cauliflower-like excrescences were present on the end of the penis, and the organ was greatly enlarged and hardened for a distance of 5 ins. The diseased portion was removed, and the slit portion of the urethra sutured to the end of the stump in such a manner as to diminish risk of stricture. The patient made a good recovery and was able to urinate quite freely until its destruction on account of age.

WYSSMANN, E. "Traumatic Subcutaneous Emphysema" (Über traumatisches Hautemphysem). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 1. January 1919. Pp. 20-34.

DIETETICS.

ARMSBY, H. P., and FRIES, J. A. "Net Energy Values of Alfalfa Hay and of Starch." *Journ. Agric. Res.* Vol. XV., No. 5. 4th November 1918. Pp. 269-286. xv. + 8 Tables.

CAZALBOU, L. "The Utilisation of Alimentary Principles" (L'utilisation des principes alimentaires). *Rev. Path. Comp.* Vol. XVIII., No. 150. November 1918. Pp. 42 (254)-45 (257).

CAZALBOU, L. "The Utilisation of Alimentary Principles by Mammals" (L'utilisation des principes alimentaires chez le mammifère). *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 25 (25)-28 (28).

"Clover versus Alfalfa for Milk Production." *Bull. No. 327.* Ohio Agric. Exp. Station. July 1918. Pp. 3-36. xxiii. + 36 Tables.

"Alfalfa appears to be a better appetiser than clover. When the hays are of equal quality neither can be said to be greatly superior for milk production. The alfalfa showed a stronger tendency to maintain the weight of the animals. The clover rations show a smaller amount of digestible protein consumed per 100 lbs. of milk produced. . . . The total nutrients consumed per 100 lbs. of milk were also a little greater with the alfalfa rations. . . . The results of these tests indicate that a unit of clover protein is more efficient in milk production than a unit of alfalfa protein."

"Feeding Experiments with Laying Hens." *Bull. No. 322.* Ohio Agric. Exp. Station. March 1918. Pp. 199-241. 55 Tables, 3 Figures.

"On the basis of results secured in this experiment it is recommended that no wheat should be used in rations for laying hens, especially at this time when there is great need for all available wheat for human food, and at no time unless there is an overproduction of wheat and it is worth less per lb. than corn (maize)."

GENNYS, R. H. "Value of Silage for Dairy Cows." *Agric. Gazette, N. S. W.* Vol. XXIX., No. 11. November 1918. Pp. 809-811.

"Silage is a great standby and insurance, not only against diminution of the products of dairy cows in lean periods, but against the loss of valuable milkers themselves and of their potential progeny."

HUNTER, O. W. "Bacteriological Studies on Alfalfa Silage." *Journ. Agric. Res.* Vol. XV., No. 11. 10th December 1918. Pp. 571-592. 3 Graphs, 3 Tables.

"Silage made from alfalfa alone is of an inferior quality. By the addition of an available carbohydrate supplement, a good quality of silage may be produced. The microbial flora of the two types of silage, so far as noted, was practically identical. The chemical data demonstrate that alfalfa with a supplement produced a higher acid content than alfalfa alone. Alfalfa silage shows a greater amount of protein decomposition, as evidenced by the amino-nitrogen and ammonia determination. The decomposition of protein was checked by the addition of a utilisable carbohydrate."

LAPICQUE, L. "The Use of Marine Algae as Food for Horses" (Emploi des algues marines pour l'alimentation des chevaux). *C. R. Acad. Sci.* Vol. CLXVIII., No. 27. 30th December 1918. Pp. 1082-1085.

Up to the present *Laminaria flexicaulis* appears to be the best species,

and should prove a valuable resource of food, equivalent (in Brittany) to a million quintals of oats per annum.

LINTON, R. G. "The Nutritive Value of 'Hay Seeds.'" *Vet. Journ.* Vol. LXXV., No. 2. February 1919. Pp. 58-60.

M'CARRISON, R. "The Pathogenesis of Deficiency Disease." *Brit. Med. Journ.* No. 3033. 15th February 1919. Pp. 177-178. 1 Plate (4 Figures), 3 Charts, 4 Tracings.

MELLANBY, MAY. "An Experimental Study of the Influence of Diet on Teeth Formation." *Lancet.* Vol. CXCV., No. 4781. 7th December 1918. Pp. 767-770. 4 Figures. *Dental Record.* Vol. XXXIX., No. 1. January 1919. Pp. 22-28. 4 Figures.

PALMER, C. B. "The Hog in Relation to Municipal Garbage." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 227-230.

Briefly describes a municipal experiment in the feeding of city garbage to pigs as undertaken in Easton, Penn., U. S. A.

PEW, W. H., EVVARD, J. M., and DUNN, R. "Limiting the Grain Ration for Fattening Cattle." *Bull. No. 182. Agric. Exp. Station, Iowa State Coll. of Agric.* October 1918. Pp. 315-344. 11 Figures, 4 Tables.

"In comparing limited feeding and full feeding of two-year-old steers for a period of 120 to 160 days, as carried on during the operations of 1915-16 and 1916-17, the difference in daily and total gains is small and somewhat in favour of the heavy grain feeding. . . . Whether or not limited or full feeding should be followed is dependent largely on the final selling value. When a large premium is being paid for well-finished cattle then the heavy feeding will be more profitable, but when such premium is not paid and there is but very little spread between the well-finished and the light corn-fed cattle, the limited corn-fed cattle will pay out the best."

PLACE, F. E. "The Balanced Ration." *Journ. Dept. Agric. S. Australia.* Vol. XXII., No. 2. September 1918. Pp. 103-109.

SATRE, A. "Germinated Oats as a Food for Horses" (Alimentation des chevaux d'une formation sanitaire pendant les deux dernières années de campagne: Emploi de l'avoine germée). *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 17 (17)-19 (19).

"Third Report on Cattle Feeding Experiments Conducted at the Schools of Agriculture and Experiment Farms at Cedara, Natal, and Potchefstroom, Transvaal." *Bull. No. 8. Dept. Agric. Union of S. Africa.* 1918. Pp. 47. 23 Figures, 14 Tables.

WYLLIE, J., and KINROSS, AGNES. "Report on Experiments on the Feeding Value of Bracken Rhizomes for Pigs and Poultry." *Bull. No. 89.* West of Scotland Agric. Coll. 1919. Pp. 103-107.

"It is impossible to draw any definite conclusions as to the feeding value of bracken rhizomes from such a limited experience, but it cannot be said that the above results are very encouraging . . . the number of pigs under trial was too small to justify a definite statement being made either for or against bracken rhizome. Further experiments are also required with poultry, not only for egg production but also for fattening purposes."

[See also Hendrick, "The Composition and Food Value of Bracken Rhizomes," this *Review*, 1919, III. 22.]

GENERAL.

HOBSON, G. "British Friesian Cattle." *Trans. Highland and Agric. Soc., Scotland.* Ser. V., Vol. XXX. 1918. Pp. 35-55. 4 Figures.

HOGARD, F. "Veterinary Service in the First Lines at the Commencement of the Campaign." *Amer. Journ. Vet. Med.* Vol. XIV., No. 1. January 1919. Pp. 7-12.

HUFF, L. B. "Practical Conservation in the Disposal of Dead Animals." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. Pp. 585-587.

The object of this paper is to call attention to a safe method "of disposing of carcasses through the rendering process, whether death occurs from contagious or other diseases, with the one exception of animals dying from anthrax. This method of disposal, properly carried out, will, with increased sanitation and safety from disease spreading, yield greater monetary returns than is now realised. It will turn what is now absolute and comparative waste into saving and conservatism. This especially applies to fats so much needed by the nation at this time."

NICHOLAS, E. "Veterinary Service at the Front." *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 63-68. (Translation.)

SMITH, F. "The Work of the British Army Veterinary Corps at the Fronts." *Vet. News.* Vol. XV., No. 781. 21st December 1918. Pp. 435-438. *Ibid.* No. 782. 28th December 1918. Pp. 442-445. *Ibid.* Vol. XVI., No. 783. 4th January 1919. Pp. 2-7. *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 8-16. *Ibid.* No. 2. February 1919. Pp. 45-58. *Vet. Record.* Vol. XXXI., No. 1596. 8th February 1919. Pp. 274-276. *Ibid.* No. 1597. 15th February

1919. Pp. 283-284. *Ibid.* No. 1598. 22nd February 1919. Pp. 290-292. *Ibid.* No. 1599. 1st March 1919. Pp. 298-300.

STECKELL, L. M. "Food Supply Problems and the Veterinarian's Responsibility." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 231-234.

SUTER, P. H. "Illawarra Cattle." *Journ. Dept. Agric. S. Australia.* Vol. XXII., No. 5. December 1918. Pp. 379-381. 2 Figures.

"Illawarra cattle might fairly be claimed to be a distinct breed of a specially fine dairy cattle. They are known as Illawarra cattle, South Coast shorthorns, and majors. They received the name of Illawarra cattle on account of their having been perfected and the type fixed in what is known as the Illawarra district of New South Wales. . . . The consensus of opinion goes to show that they have been graded up from cattle with mixed blood running in their veins. . . . The present Illawarra cattle are exceedingly like what is termed the ideal milking shorthorn, and it would be an exceedingly difficult task for any person to authoritatively state the difference between them."

GENETICS AND HEREDITY.

M'GILVRAY, C. D. "Stallion Enrolment." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 222-226.

"The following diseases are specially named in the Act [Horse Breeders' Act, Manitoba, 1916] as being unsoundness of an hereditary nature: Bone spavin, ringbone, navicular disease, chorea, periodic ophthalmia, and cataract, also bog spavin, thoroughpin, curb, and sidebone, the latter conditions particularly when accompanied by defective conformation or structural weakness. The omission of roaring from the list of scheduled diseases is owing to the fact that its hereditary nature is still a disputed question."

HYGIENE AND PREVENTIVE MEDICINE.

BALLHAUSEN, O. C. "Pasteurisation." *Agric. Gazette, N. S. W.* Vol. XXIX., No. 8. August 1918. Pp. 585-591.

"There are two processes of pasteurisation now in general use, differing slightly from each other, and known as the flash and holding methods. Each has its adherents, and each gives equally satisfactory results when correctly handled. Of the former there are two distinct makes in New South Wales, each imparting the necessary heat, usually about 180°, in a rapid manner. One depends on some outside source for the entire cooling of the cream, and

the other partially cools the heated cream by allowing it to come into contact with a surface already somewhat cooled by the incoming unpasteurised cream."

BRENTANA, D. "The Production and Supply of Milk" (Alcune considerazioni sulla produzione, l'industria e l'approvigionamento del latte). *Il Moderno Zootro.* Parte Sci. Ser. V., Vol. VII., No. 10. October 1918. Pp. 218-223.

DELEPINE, S. "A Clean Milk Supply." *Brit. Med. Journ.* No. 3026. 28th December 1918. Pp. 715-716.

The author has come to the conclusion that to obtain a clean milk supply the following conditions must be observed:—Clean shippings, cows, and farm hands. Sterilised covered milk pails. No handling of the milk at the farm beyond transfer from sterilised pail to sterilised churn. Rapid transit from farm to town in clean cool vans. Distribution of milk to consumer in sterilised vessels with as little handling as possible.

PEDERSEN, C. "Feeding Stalls for Cows." *Agric. Gazette, N. S. W.* Vol. XXIX., No. 11. November 1918. Pp. 805-808. 3 Figures.

PFENNINGER, W. "The Importance of Bacteriological Examination of Meat" (Die Bedeutung der bakteriologischen Fleischuntersuchung). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 1. January 1919. Pp. 6-20.

SATRE, A. "General Hygiene of French Army Horses during the Last Two Years of the War" (Hygiène générale des chevaux d'une ambulance pendant les deux dernières années de campagne). *Rer. Path. Comp.* Vol. XVIII., No. 151. December 1918. Pp. 22 (282), 25 (285).

INFECTIOUS DISEASES.

ALBERT, F. "Absorption of Tetanus Toxin" (Voie d'absorption de la toxine tétanique). *C. R. Soc. Biol.* Vol. LXXXI., No. 22. 7th December 1918. Pp. 1127-1130.

ALFORD, I. S. "Mixed Bacterin in Hemorrhagic Septicemia." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. Pp. 582-584.

ALLEN, J. A. "A Preliminary Note on Infectious Keratitis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 307-313. 1 Figure.

BOQUET, A., and NÈGRE, L. "Infection, Sensitisation, and Immunity in Epizootic Lymphangitis" (L'infection, la sensibilisation, et l'immunité dans la lymphangite épidotique des solipèdes). *C. R. Acad. Sci.* Vol. CLXVIII., No. 8. 24th February 1919. Pp. 421-423.

BOQUET, A., NÈGRE, L., and ROIG, G. "Epizootic Lymphangitis of Solipeds. Parasitology, Experimental Study, Treatment and Prophylaxis" (La lymphangite épidotique des solipèdes. Parasitologie et étude expérimentale. Traitement et prophylaxie). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 323. November 1918. Pp. 553-566. *Ibid.* No. 324. December 1918. Pp. 617-634. 3 Figures.

BULL, L. B. "Impetigo of the Pig." *Journ. Dept. Agric. S. Australia.* Vol. XXII., No. 2. September 1918. Pp. 110-114. 1 Figure. *Queensland Agric. Journ.* Vol. X., No. 5. November 1918. Pp. 223-225. 1 Figure.

CAHILL, E. A. "Hog Cholera Control in the East." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 314-321.

CARTER, E. B. "Complicated Hemorrhagic Septicemia in Hogs." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. Pp. 579-581 and 635.

COHEN, B. "The Resistance of the Glanders Bacillus to Calcium Hypochlorite." *Journ. Inf. Dis.* Vol. XXIV., No. 1. January 1919. Pp. 51-55. 1 Chart, 1 Table.

"Studies were made on the specific resistance of the glanders bacillus toward calcium hypochlorite in concentration employed for the disinfection of water supplies. When compared to *B. coli*, *B. mallei* is, if anything, more sensitive toward hypochlorite. Hypochlorite may be effectively used in the disinfection of horse troughs as a harmless prophylactic measure in glanders-infected regions."

COMINOTTI, L. "Swine Fever" (Alcune considerazioni sul paratifo dei suini). *La Clinica Vet.* Vol. XLII., Nos. 23-24. 15th-31st December 1918. Pp. 613-616.

A consideration of the relation of *Bacillus voldagensen* and *Bacillus suispestifer* to swine fever.

CREMONA, P. "Crystals of Sulphate of Copper in the Treatment of the Conjunctivitis of Epizootic Lymphangitis" (I cristalli di solfato di rame nel trattamento delle congiuntiviti da lynnosporidium). *Il Nuovo Ercolani.* Vol. XXIII., No. 24. 31st December 1918. Pp. 305-308.

DIMOCK, W. W. "Differential Diagnosis of Diseases of Swine." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 321-337.

"The work of the practitioner of veterinary medicine, or the development of 'pig practice,' as so many term it, has increased remarkably in the last few years. In the early days the owner seldom considered that it was worth while to call a veterinarian in case of sickness among pigs. . . . Experience has shown (in Iowa) that in a great many cases where a number of individuals in the herd are sick it is necessary to take into consideration the following diseases:—Hog cholera, haemorrhagic septicaemia (all forms), infectious enteritis (or necrobacillosis), pneumonia, non-specific septicaemia, parasites, poisoning (from brine and stock remedies), and salmonellosis."

DODD, S. "Studies in 'Black Disease.' A Braxy-like Disease of Sheep." *Agric. Gazette, N. S. W.* Vol. XXIX., No. 9. September 1918. Pp. 657-662. *Ibid.* No. 11. November 1918. Pp. 799-804. *Ibid.* No. 12. December 1918. Pp. 857-870.

DORSET, M., M'BRYDE, C. N., NILE, W. B., and RIETZ, I. H. "Observations Concerning the Dissemination of Hog Cholera by Insects." *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 55-60.

FINZI, G. "Auto-Toxin-Vaccinotherapy in 'Foot-and-Mouth' Disease" (Auto-vaccino-tossino-terapia nell'epizootica). *Il Nuovo Ercolani.* Vol. XXIV., No. 3. 15th February 1919. Pp. 17-19.

During the febrile period of the disease the author removes blood from the jugular vein and, with the same syringe, injects it subcutaneously at the base of the neck of the same animal. In adult animals the quantity of blood he uses is 150 c.c.; in heifers 50 to 75 c.c.; and in calves 20 to 25 c.c.

GAIR, G. "Transmission by Cows' Milk of *B. diphtheriae*." *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. Pp. 447-451.

In a serious outbreak of diphtheria the infection was apparently carried by flies from a sewage tank to the udders and teats of cows. Thence the organisms found their way into the milk.

HADLEY, F. B. "Contagious Abortion Questions Answered." *Bull. No. 296. Agric. Exp. Station. Univ. Wisconsin.* September 1918. Pp. 1-36. 7 Figures, 2 Tables.

HALLMAN, E. T. "Infectious Abortion and its Complications as a Cause of Sterility." *Amer. Journ. Vet. Med.* Vol. XIII., No. 10. October 1918. Pp. 475-481. *Ibid.* No. 11. November 1918. Pp. 533-541. *Ibid.* No. 12. December 1918. Pp. 591-596 and 635-636.

HEALY, D. J. "Salicylic Acid as a Remedy for Chronic Hog Cholera." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 633-638.

KNOWLES, R. H. "Treatment of Ulcerative Lymphangitis by Vaccines made from the Preisz-Nocard Bacillus prepared with Ethyl-Chloride." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 262-272.

M'ARTHUR, C. I. "Transmissibility of Immunity from Mother to Offspring in Hog Cholera." *Journ. Inf. Dis.* Vol. XXIV., No. 1. January 1919. Pp. 45-50.

MFADYEAN, J. "Sarcosporidia as the Cause of Scrapie." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 290-299.

This is a criticism of M'Gowan's reply (*vide infra*).

M'GOWAN, J. P. "Scrapie." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 278-290.

In *Journ. Comp. Path. and Therap.*, 1918, xxxi. 102-131 (this *Review*, 1918, II. 448), M'Fadyean criticised statements contained in M'Gowan's "Investigation into the Disease of Sheep called 'Scrapie'" (from Edinburgh and East of Scotland Agricultural College), Wm. Blackwood & Sons, Edinburgh, 1914. This is a reply to the criticisms.

MOHLER, J. R. "Vesicular Stomatitis of Horses and Cattle." *Bull. No. 662. U. S. Dept. Agric.* 1918. Pp. 10. 1 Plate.

The subject-matter of this *Bulletin* has been noted from another source (this *Review*, 1918, II. 166).

MOORE, V. A. "The Veterinary Practitioner in the Control of Infectious Diseases." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 211-216.

"The schools must insist on training their students in both the theory and application of the sciences of veterinary medicine. The students must be disciplined in laboratory and clinical work. Men who have such preparation, and who possess the professional instinct, know the necessity of early diagnosis, the danger of delay, and that to succeed they must work with natural laws, not against them. They see in practice the necessity for correlation of research, technical instruction, and official supervision."

PERRUCCI, P. "Post-Serum Localised Tetanus in a Horse" (Sulle forme locali di tetano nel cavallo siero-profilassato). *Il Moderno Zootiatro.* Parte Sci. Ser. V., Vol. VII., No. 11. November 1918. Pp. 225-236.

- PETIT, H. "Transmission of 'Foot-and-Mouth' Disease to Man by Milk" (Note sur la transmission de la fièvre aphteuse bovine à l'homme par la consommation du lait). *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 7 (7)-8 (8).
- QUEVEDO, J. M., and SCASSO, R. "Bacillus *paratyphosus* and Swine Fever" (Peste porcina determinada por paratípicos (Salmonelosis)). *Revista Soc. Med. Vet.* Vol. IV, No. 1. November 1918. Pp. 480-483.
- REMLINGER, P. "The Diffusibility of the Rabies Virus" (La diffusibilité du virus rabique). *Ann. Inst. Pasteur.* Vol. XXXIII, No. 1. January 1919. Pp. 28-52.
- "Immunisation of the Rabbit against Sub-Dural Inoculation with Rabies Virus by Means of Brain treated with Ether" (Immunisation du lapin contre l'inoculation sous-dure-mérienne de virus rabique fixe au moyen de cerveaux traités par l'éther). *C. R. Soc. Biol.* Vol. LXXXII., No. 2. 25th January 1919. Pp. 52-54.
- "Rabies: Hereditary Immunity" (Contribution à l'étude de l'immunité héréditaire contre la rage). *C. R. Soc. Biol.* Vol. LXXXII., No. 4. 22nd February 1919. Pp. 142-144.
- RETTGER, L. F., and WHITE, G. C. "Infectious Abortion in Cattle." *Bull. No. 93.* Storrs Agric. Exp. Station, Connecticut. 1918. Pp. 199-248.
- RUGGERINI, G. "The Treatment of Epizootic Lymphangitis" (Contributo pratico alla terapia del farcino criptococcico). *La Clinica Vet.* Vol. XLI., Nos. 1-2. 15th-31st January 1919. Pp. 1-10. *Ibid.* No. 3. 15th February 1919. Pp. 69-83.
- SAFFONS, S. "Contribution to the Study of 'Pasteurelosis.' 'Septicæmia Haemorrhagica Ovina'" (Contribución al estudio de las "Pasteurelosis." "Septicemia hemorrágica ovina"). *Revista Zootecnica.* Vol. VI, No. 62. November 1918. Pp. 153-154.
- SCHWARZE, H. R. "Bacillus *necrophorus* Infection in Swine." *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 51-54.
- SMILLIE, E. W. "An Improvement in the Method of Isolating and Recovering the Bacillus of Cattle Abortion through Guinea-Pigs." *Journ. Exp. Med.* Vol. XXVIII., No. 5. November 1918. Pp. 585-605. 2 Figures, 6 Tables.
- SMITH, T. "Spirilla Associated with Disease of the Fetal Membranes in Cattle (Infectious Abortion)." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 701-719. 2 Plates (7 Figures).

SOLIS, J. "Results obtained by Malleinisation" (Resultados obtenidos por la maleinización). *Revista Hig. y Sanidad Pecuarias.* Vol. VIII., Nos. 11-12. November-December 1918. Pp. 707-712.

Because of a serious outbreak of glanders, thirty-three equines were subjected to the mallein test. The temperature reactions are described.

TARANTINO, G. B. "A New Form of 'Horse-Sickness'" (Contributo allo studio della peste equina (Una nuova varietà della forma clinica cefalica od edematoso)). *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VII. No. 12. December 1918. Pp. 264-266.

In Eritrea the author has encountered what he believes to be a new clinical manifestation of "horse-sickness" in two Abyssinian mules. There was marked œdema of the upper eyelid, the third eyelid covered the front of the eye, the conjunctiva was brick-red, and there was abundant reddish fluid in the inner angle of the eye.

TEN BROECK, C. "The Survival of the Hog-Cholera Virus in Laboratory Animals, particularly the Rat." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 749-757. 1 Table.

— "A Study of Paratyphoid Bacilli Isolated from Cases of Hog-Cholera." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 759-777. 14 Tables.

TIFFANY, L. C. "Hemorrhagic Septicemia in Bovines." *Amer. Journ. Vet. Med.* Vol. XIV., No. 1. January 1919. Pp. 1-5.

TULLOCH, W. J. "The Isolation and Serological Differentiation of *Bacillus tetani.*" *Proc. Roy. Soc. Ser. B*, Vol. XC., No. B626. April 1918. Pp. 145-158. 7 Diagrams.

VAN SACEGHEM, R. "Ulcerative Lymphangitis" (Recherches et expériences sur la lymphangite ulcéreuse des équidés). *Bull. Soc. Path. Exot.* Vol. XII., No. 1. January 1919. Pp. 9-11.

WASHBURN, H. J. "Hemorrhagic Septicemia." *Farmers' Bull. No. 1018.* U. S. Dept. Agric. October 1918. Pp. 8.

A short account of the various forms of hæmorrhagic septicæmia (stock-yards fever, swine plague, fowl cholera, etc.) written for the guidance of farmers. "No form of treatment has time to become effective for any animals that may be affected. The apparently healthy animals should be separated from the diseased and placed in clean, uninfectious quarters. Bacterins (bacterial vaccines) . . . have proved to be effective in many instances in checking the spread of an outbreak and in protecting the unaffected portion of the herd or flock."

WILLIAMS, W. L. "The Bland Reports upon Epizootic Abortion Experiments." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 628-633

A criticism of the Oxfordshire Epizootic Abortion Experiments Reports (G. R. Bland), an account of which was given in this *Review*, 1917, I. 169-170.

MEDICINE.

CODERQUE, R. "Diseases of the Conjunctiva" (Enfermedades de la conjuntiva). *Revista Hig. y Sanidad Pecuarias.* Vol. VIII., Nos. 11-12. November-December 1918. Pp. 669-676.

In mild catarrhal conjunctivitis, wash twice a day with a 0·25 per cent. solution of sulphate of zinc, and apply once or twice daily a 0·5 per cent. solution of silver nitrate. In purulent conjunctivitis, wash three, four, or more times a day with a 1 per cent. emulsion of creolin, and apply once or twice daily a 2 to 4 per cent. solution of silver nitrate, followed immediately by the application of a 2 per cent. solution of chloride of sodium. In intense photophobia, instillations of a 2 per cent. solution of chloride of cocaine may be employed. In follicular conjunctivitis, apply 2 to 10 per cent. solution of nitrate of silver or sulphate of copper. In diphtheritic conjunctivitis, wash with 4 per cent. boric acid, 1 per 1000 sublimate, apply 1 to 2 per cent. silver nitrate, and powder with xeroform or protargol.

DALLING, T. "Investigations on Specific Ophthalmia, in Continuation of the Observations made whilst in the Abattoir, Paris." *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 16-24.

DE VINE, J. F. "Acute Indigestion in Calves." *Amer. Journ. Vet. Med.* Vol. XIV., No. 3. March 1919. Pp. 129-131.

GLOVER, G. H., and NEWSOM, I. E. "Further Studies on 'Brisket Disease.'" *Journ. Agric. Res.* Vol. XV., No. 7. 18th November 1918. Pp. 409-414. 3 Plates (7 Figures).

HARVEY, F. T. "Going the Wrong Way." *Vet. Record.* Vol. XXXI., No. 1579. 15th February 1919. Pp. 281-282.

Discusses the effect of medicines passing into the trachea. "Contrary to what might be expected, an animal may not give an immediate indication that something has gone wrong. A rigor may be the first symptom; then follow cold sweats and dyspnoea. The absence of cough in some instances is noticeable, and is apt to mislead. The facial expression is characteristic; in an hour or two the animal looks years older. No food is taken, and the

animal remains in one position or moves with a grunt. The temperature is at first unreliable in forming a prognosis, but it usually remains high as the case develops. If the animal is not well at the end of twenty-four hours the prognosis is often grave."

HEALY, D. J. "Parturient Paresis (Milk Fever in Cows)." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 385-386. 1 Figure.

During the present war conditions there is great difficulty in obtaining cylinders of oxygen for use in the treatment of milk fever. With proper care, filtered air can be used with as little danger of infection as can oxygen. The author figures an apparatus, consisting of a medium-sized milk-tube, an ordinary bulb syringe, and a glass carbon-filter tube filled with a plug of sterile absorbent cotton-wool through which the air entering the syringe must pass.

LHOSTE, A. "The Subcutaneous Injection of Salicylate of Sodium" (Le salicylate de soude en injections sous-cutanées). *Iter. Path. Comp.* Vol. XVIII., No. 151. December 1918. Pp. 5 (265)-7 (267).

To avoid the digestive disturbances following the administration of salicylate of sodium by the mouth, the author recommends the hypodermic injection of 2 grammes of the salt dissolved in 10 c.c. distilled water. This dose is for the larger domestic animals, and its injection for five days has been sufficient to produce cure in a horse and a cow suffering from rheumatism. The method is economical, since, in the larger herbivores, 100 to 200 grammes a day would be required if administered by the mouth.

MARTIN, W. J. "Equine Colics." *Amer. Journ. Vet. Med.* Vol. XIV., No. 3. March 1919. Pp. 111-114.

MASON, F. E. "Mortality in Camels caused by Ingestion of Sand." *Journ. Comp. Path. and Therap.* Vol. XXXI., No 4. December 1918. Pp. 260-262.

The paper relates to an investigation into the cause of a high mortality in two Indian camel corps stationed on the sandy desert at Salsia. The animals came from a region in India where sand does not exist. The author is of opinion that the cause of the mortality was the ingestion of sand, and he points out that it is dangerous to employ on desert work camels that are totally unaccustomed to sand.

MELLANBY, E. "An Experimental Investigation on Rickets." *Lancet.* Vol. CXCVI., No. 4985. 15th March 1919. Pp. 407-412.

On the basis of these experiments, rickets is interpreted as primarily a deficiency disease of a dietetic nature; but this has not prevented other

conditions from receiving attention and being considered as of some importance. A knowledge of general metabolism would not allow the exclusion of other factors. "An adequate diet is itself a unit, and its soundness, to a large extent, consists of the mutual assistance and interplay in the metabolic changes the elements experience in the body. The absence of, or deficiency in, one element means the ineffectiveness of another. For instance, the absence of carbohydrate involves a defective oxidation of fat, and probably an inefficient protein metabolism. Similarly, it is possible to imagine an abundance of accessory food factors in the diet which may, however, be ineffective because of some wrong balance in the energy-bearing materials."

MOUQUET, A. "Gastric Disorders in the Giraffe" (*Troubles gastriques chez la girafe*). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 7th November 1918. Pp. 464-467. 2 Figures.

TAVONI, C. "Symmetrical Alopecia in Bovines" (*Alopecie simmetriche nei bovini*). *La Clinica Vét.* Vol. XII., Nos. 23-24. 15th-31st December 1918. Pp. 635-641. 4 Figures.

WOLLSTEIN, M., and MELTZER, S. J. "Experimental Chemical Pneumonia." *Journ. Exp. Med.* Vol. XXVIII., No. 5. November 1918. Pp. 547-550. 2 Plates.

"The consolidations of the lung produced by chemical substances differ from infectious pulmonary inflammations only in their sterility. These experimental results strongly suggest the view that the anatomical findings in pneumonia represent a part of a mechanism of defence and repair which the animal body creates in its struggle against infection and intoxication."

METHODS.

BROWN, J. H. "A New Type of Syringe, especially Adapted for Intravenous Injections or the Aspiration of Blood." *Journ. Exp. Med.* Vol. XXVIII., No. 5. November 1918. Pp. 623-628. 3 Plates (4 Figures).

"It is suggested that there may be other uses for this type of syringe. Blood cultures might be made by aspirating blood into the tube of the syringe containing bouillon, the plunger removed, a sterile cotton plug inserted, and the tube incubated. For the collection of blood corpuscles blood might be aspirated into the tube of the syringe containing citrate solution, the plunger removed, a sterile stopper inserted, and the tube placed into the centrifuge. A slight variation of the technique would enable one to collect small samples of serum or defibrinated blood aseptically."

COMMES, C. "The Automatic Control of the Production of Indol in Culture Media" (Dispositif permettant de contrôler automatiquement la production d'indol dans les milieux de culture). *Bull. Soc. Path. Exot.* Vol. XI., No. 10. December 1918. Pp. 868-869. 1 Figure.

FISCHER, A. "Acid Production Graphically Registered as an Indicator of the Vital Processes in the Cultivation of Bacteria." *Journ. Exp. Med.* Vol. XXVIII., No. 5. November 1918. Pp. 529-545. 8 Text-Figures, 1 Plate.

"The purpose of these investigations has been for the present to show the usefulness of the method. It is hoped that by these investigations material of particular interest relating to the biochemical and physiological processes within the bacterial culture will be obtained."

FROTHINGHAM, L. "Brom Cresol Purple and Litmus as Indicators for the Classification of Tubercl Bacilli." *Journ. Med. Res.* Vol. XXXIX., No. 2. November 1918. Pp. 153-156.

MAWAS, J. "New Method of Demonstrating Iron in Tissues" (Nouveau procédé de coloration du fer dans les tissus. Action de l'alizarine monosulfonate de sodium sur le fer inorganique). *C. R. Soc. Biol.* Vol. LXXXII., No. 2. 25th January 1919. Pp. 58-79.

STÉVENEL, I. "A Modification of Borrel's Blue" (Le bleu au permanganate de potasse). *Bull. Soc. Path. Exot.* Vol. XI., No. 10. December 1918. P. 870.

The author substitutes permanganate of potassium for oxide of silver, and claims that he has obtained a very excellent stain that, without distilled water, stains in a more elective manner than Borrel's blue, and permits the easy discovery of hæmatozoa, filaria, trypanosomes, and even treponema.

OBSTETRICS.

BISSAUZE, R. "Extra-Uterine Gestation in the Domestic Animals" (La gestation extra-utérine chez les animaux domestiques). *Rev. Path. Comp.* Vol. XVIII., No. 151. December 1918. Pp. 11 (271)-16 (276).

A review of the literature on the subject.

KEMPF, S. "Retention of Fetal Membranes in the Bovine." *Amer. Journ. Vet. Med.* Vol. XIV., No. 1. January 1919. Pp. 16-17.

LERENA, C. "Sterility in the Mare" (La esterilidad en las yeguas de los Haras). *Revista Soc. Med. Vet.* Vol. III., No. 12. October 1918. Pp. 459-461. 1 Figure.

PARASITOLOGY (Including Entomology and Protozoology).

AGNOLETTI, G. "Parasitic Mange. A New Parasiticide" (Una nuova sostanza parassiticida). *La Clinica Vet.* Vol. XI.II., No. 4. 28th February 1919. Pp. 109-114.

BEDEL. "Disorders Produced by Oxyures in the Horse" (Troubles déterminés par les oxyures du cheval). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 7th November 1918. Pp. 452-458.

CARBURY, H. W. "Demodectic Mange in Pigs" *N. Z. Journ. Agric.* Vol. XVII., No. 6. December 1918. Pp. 326-328. 1 Figure.

"During the last year two specimens have been received at the Wallaceville Laboratory (New Zealand) of follicular or demodectic mange affecting pigs. As these are the first specimens of this condition which have been recognised in this country, they are considered worthy of a short notice."

CURASSON, G. "The Treatment of Sarcoptic Mange in the Dromedary" (Au sujet du traitement de la gale du dromadaire). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 481-482.

— "The Treatment of Trypanosomiases" (Sur le traitement des trypanosomiases animales au Soudan). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 482-488.

DECLAUDE. "Treatment of Parasitic Mange of the Horse with *Pommade Lacombe*" (Traitement de la gale du cheval avec la Pommade Lacombe). *Bull. Soc. Méd. Vét. Pratique.* Vol. III., No. 2. February 1919. Pp. 53-55.

Good results are reported.

DEGREEF, G. "Nervous Symptoms and Persistence of Trypanosomes in the Cerebro-Spinal Fluid of Mules Affected with Nagana due to *Trypanosoma brucei* var. *ugandae*" (Symptômes nerveux et persistance des trypanosomes dans le liquide céphalo-rachidien de mules atteintes de nagana du au *Trypanosoma brucei* var. *ugandae*). *Bull. Soc. Path. Exot.* Vol. XII., No. 1. January 1919. Pp. 17-21.

DONNAT, C. "Clinical Notes on Equine Oxyurosis" (Notes cliniques sur l'oxyurose des équidés). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 7th November 1918. Pp. 458-464.

DOUVILLE. "The Spontaneous Cure of Parasitic Mange" (De la cure d'air et de la guérison spontanée de la gale). *Rec. Méd. Vét.* Vol. XCIV., No. 21. 15th November 1918. Pp. 563-571.

FAVERO, F. "The Sulphuration Chamber for the Cure of Equine Mange" (Le camere a solforazione nella cura della rogna degli equini). *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VII., No. 12. December 1918. Pp. 241-257. 3 Figures.

FINZI, G., and SACCO, P. "The Bovine Hæmoglobinuria of the Pre-Alpine Regions of Piedmont is a Piroplasmosis" (L'emoglobinuria dei bovini delle regioni prealpine del Piemonte è una piroplasmosi). *Il Nuovo Ercolani.* Vol. XXIV., Nos. 1-2. 15th-31st January 1919. Pp. 12-13.

A brief note in confirmation of the conclusion arrived at by Cominotti and Di Domizio (see this *Review*, 1919, III. 49).

GAY. "Note on the Treatment of Mange by Sulphuration" (Note au sujet du traitement de la gale par le sulfuration). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 324. December 1918. Pp. 635-640.

GOODALL, T. B. "About Hæmatozoa and their Intermediary 'Carriers' or 'Bearers.'" *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. Pp. 437-447.

GRIFFITHS, J. A. "A Note on Piroplasmosis of the Donkey." *Vet. Record.* Vol. XXXI., No. 1595. 1st February 1919. Pp. 265-266.

The subject-matter of this paper has also appeared in *Journ. Comp. Path. and Therap.*, 1918, xxxi. 131-133 (see this *Review*, 1918, II. 529).

HADWEN, S. "Parasitic Diseases." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 639-642. 3 Figures.

HADWEN, S., and CAMERON, A. E. "A Contribution to the Knowledge of the Bot-Flies, *Gastrophilus intestinalis* de G., *G. haemorrhoidalis* L., and *G. nasalis* L." *Bull. Entom. Res.* Vol. IX., No. 2. September 1918. Pp. 91-106. 1 Coloured Plate (3 Figures). 10 Figures.

HALL, M. C., WILSON, R. H., and WIGDOR, M. "The Anthelmintic Treatment of Equine Intestinal Strongylidosis." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 272-278.

Reprinted from *Journ. Amer. Vet. Med. Assoc.*, 1918, liv. 47-55.

IMES, M. "The Spinose Ear Tick, and Methods of Treating Infested Animals." *Farmers' Bull.* No. 980. U. S. Dept. Agric. May 1918. P. 8. 4 Figures.

A short account of the nature and habits of *Ornithodoros megnini* written for the guidance of farmers. The treatment suggested is the injection into the ear of about half an ounce of a mixture of two parts by volume of ordinary commercial pine tar and one part by volume of cotton-seed oil. The warm mixture is injected by means of an ordinary metal or hard rubber syringe holding from 1 to 2 ozs.

JACK, R. W. "A Form of Myiasis in Cattle." *Rhodesia Agric. Journ.* Vol XV., No. 6. December 1918. Pp. 539-540. 1 Plate.

"A number of maggots were received at this office, stated to have been taken from large cavities in the subcutaneous tissues of cattle in the Mazoe Valley. . . . The flies which were eventually bred out from the maggots supplied do not, however, appear to have been associated with myiasis before. . . . The fly itself is the 'blue-bottle' type, the whole body being of a dark but brilliant metallic blue. The length of an average specimen, from the front of the head to the tip of the abdomen, is about 9 mm. The sides of the face or 'cheeks' are buff coloured and the wings are free from the dark markings shown by the common allied species (*Pycnosoma marginale*). Whilst the present species bears the characteristics of the genus *Pycnosoma*, its specific identity is unknown to the writer. The larva or maggot and the pupa are of the form shown in the plate, the greatest length amongst the maggots submitted being about 14 mm., whilst the average pupal length is about 11½ mm."

JOHNSTON, T. H., and BANCROFT, M. J. "Report on Mr. Munro Hull's Claims Regarding Tick-Resisting Cattle." *Queensland Agric. Journ.* Vol. XI, No. 1. January 1919. Pp. 31-39. *Ibid.* No. 2. February 1919. Pp. 76-78.

"In the September 1912 number of this *Journal* Mr. G. W. Munro Hull, of Eumundi, North Coast Line, called attention to the existence of a tick-resisting condition in a certain number of the cows forming his dairy herd, such animals remaining free from tick infestation whilst the remainder were regularly attacked. He believed that this peculiarity was caused by the presence in such animals of some tick-destroying microbe, and that it was possible to convey the resistant quality to other animals by vaccination of the latter with some of the 'lymph' occurring chiefly on the escutcheon of resistant animals. . . . The only experimental evidence brought forward by the authors in support of Mr. Hull's claims is that which endeavours to show that on some cows very few ticks will mature and become engorged."

LIGNIÈRES, J. "Diseases Transmitted by Ticks" (Enfermedades transmitidas por las garrapatas. Su clasificación, tratamiento y profilaxis). *Revista Zootecnica*. Vol. VI., No. 61. October 1918. Pp. 72-84.

Paper presented at the Tenth International Veterinary Congress, London, 1914.

MACDOUGALL, R. S. "Insect and Arachnid Pests of 1917." *Trans. Highland and Agric. Soc., Scotland*. 5th Ser., Vol. XXX. 1918. Pp. 56-96. 24 Figures.

Deals with sheep scab, horse lice, and the horse bot-fly.

MOYANO, O. "Critical Study of the Measures Necessary to Combat Bovine Piroplasmosis" (Estudio critico sobre las medidas que se toman en el pais para combatir la piroplasmosis bovina). *Revista Soc. Med. Vet.* Vol. III., No. 12. October 1918. Pp. 421-451. 2 Figures.

RAILLIET, A. "General Disorders Produced by Oxyures" (Sur les troubles généraux occasionnés par les Oxyures). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 7th November 1918. Pp. 450-452.

SCHWARTZ, B. "Observations and Experiments on Intestinal Trichinæ." *Journ. Agric. Res.* Vol. XV., No. 8. 25th November 1918. Pp. 467-482. 3 Figures.

SCOTT, J. W. "Notes and Experiments on *Sarcocystis tenella* Railliet." *Journ. Parasitology*. Vol. V., No. 2. December 1918. Pp. 45-60. 5 Tables.

SIMON, R. "The Microscopic Lesions in Mange" (Les lésions microscopiques de la gale). *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 323. November 1918. Pp. 566-572. 5 Figures.

— "Microscopic Lesions of Mange." *Amer. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 60-63. 5 Figures. (Translation of foregoing article.)

SMYTHE, E. R. "Observations on New Rabbit Disease and its Relation to Coccidiosis." *Vet. Record.* Vol. XXXI., No. 1592. 11th January 1919. Pp. 229-231.

STEWART, F. H. "Recent Experiments on the Life-History of *Ascaris lumbricoides*." *Brit. Med. Journ.* No. 3030. 25th January 1919. P. 102.

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TORTI, E. "Bath for the Cure and Prevention of Parasitic Dermatoses" (Di una vasca da bagno per quadrupedi per la cura e profilassi delle dermatosi parassitarie). *Il Nuovo Ercolani.* Vol. XXIII., No. 23. 15th December 1918. Pp. 293-298. 3 Figures.

Gives plans and details of a bath for the prevention and treatment of parasitic skin diseases in the larger animals.

WIGDOR, M. "A Note on the Effect of Cold on the Degree of Parasitic Infestation." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 251-254.

"It thus appears that freezing temperatures of several days' duration would tend to diminish the degree of parasitic infestation, and it therefore seems feasible that manure or faeces might be disinfected against most parasitic ova, especially hook-worm ova, by being kept at a very low temperature for several days, without destroying the value of the manure as fertiliser, were this procedure practicable."

— "A New Fluke from the Dog." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 254-257. 1 Figure.

Twelve specimens of a new species of fluke have been found in the intestine of one dog out of 350 examined post-mortem at Detroit, Mich., U. S. A. The new species falls into the subfamily Opisthorchiinæ, "but it cannot be correlated with any well-established genus within that group, and hence has been placed in a new genus, *Hallum*, Wigdor, 1918. This genus appears to fill a gap in the genera of the subfamily Opisthorchiinæ as regards the extent of the vitellaria. . . . In the genus *Hallum* the vitellaria extend anteriorly beyond the acetabulum and posteriorly beyond the ovary and testes."

WILLIAMS, T. H. "Lice and Tick on Sheep." *Journ. Dept. Agric. S. Australia.* Vol. XXII., No. 3. October 1918. Pp. 224-232. 8 Figures.

A plan and description of Cooper and Nephews' model dipping plant are given.

PATHOLOGY AND BACTERIOLOGY.

AVERY, O. T., and CULLEN, G. E. "The Use of the Final Hydrogen Ion Concentration in Differentiation of *Streptococcus haemolyticus* of Human and Bovine Types." *Journ. Exp. Med.* Vol. XXIX., No. 2. February 1919. Pp. 215-234. 2 Figures, 8 Tables.

"Of 124 strains of *Streptococcus haemolyticus* from known human origin 116 reached a final hydrogen ion concentration of from pH 5.0 to 5.3.

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Only 8 reached a pH more acid than 5·0 and none more acid than pH 4·8 Of 45 strains of *Streptococcus haemolyticus* from bovine sources, including 26 strains isolated from milk and the udder of cows, and 19 from cream cheese, 40 reached a final hydrogen ion concentration of pH 4·3 to 4·5. Of the remaining 5 which reached a pH of 5·0 to 5·2, 2 were of known human type, and 3 of uncertain diagnosis. A rapid and practical application of this method is proposed as a presumptive test in the differentiation of human and bovine types of *Streptococcus haemolyticus*."

DAVIS, D. J. "Further Observations in Hemolytic Streptococci in Milk." *Journ. Inf. Dis.* Vol. XXIII., No. 6. December 1918. Pp. 559-561.

"Further observations have revealed the presence of haemolytic streptococci of the *lacticus* type in dairy milk in twenty-three of ninety-two samples. In this series they were far more common in non-pasteurised than in pasteurised milk. They are less virulent for rabbits than the haemolytic streptococci of human origin. Two strains were found with moderate pathogenic power for rabbits. While, in general, one may be practically sure that organisms of the *lacticus* type are not dangerous to man, still individual organisms or strains of human, milk, or bovine origin suspected of being responsible for sore throats or other infections in man should be carefully studied and compared with a view to finding specific common characters."

An earlier paper by the same author appeared in *Journ. Inf. Dis.*, 1916, xix., 236-252 (see this *Review*, 1917, I. 145).

DOLLEY, D. H., and GUTHRIE, F. V. "The Pigmentation of Nerve Cells. I. The Non-Fatty, Melanotic Pigment in the Dog and Rabbit Produced by Chronic Depression." *Journ. Med. Res.* Vol. XXXIX., No. 1. September 1918. Pp. 123-142. 1 Table.

"Pigment is not a natural constituent of the cells of any region of the central nervous system or of the Gasserian, spinal, vagus, and superior cervical ganglia of the rabbit and dog. Pigment is not a product of normal or hypernormal functional activity. A melanotic pigment is produced by functional depression of some duration in any or all cells of the rabbit and dog. . . . Under no conditions does a fat-holding pigment occur in the nerve cells of the rabbit and dog."

JONES, F. S. "Studies in Bovine Mastitis. III. Infection of the Udder with Micrococci and other Micro-Organisms." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 721-733. 3 Tables.
"IV. The Source of Infection in Streptococcal Mastitis." *Ibid.* Pp. 735-748. 9 Tables.

QUIROGA, S. S. "The *Cocobacillus acridiorum* of d'Herelle" (*El Cocobacillus acridiorum de d'Herelle*). *Revista Soc. Med. Vet.* Vol. IV., No. 1. November 1918. Pp. 467-479.

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RONCA, V. "A Frequent Form of Interstitial Nephritis in Bovines" (Di una forma frequente di infiammazione interstiziale a piccoli focolai nei reni di bovino). *La Clinica Vet.* Vol. XLI., Nos. 23-24. 15th-31st December 1918. Pp. 616-635. 1 Figure.

STEVENSON, W. "Dairy Bacteriology. Part II. Bacteriology of Cream, Butter, and Cheese." *Trans. Highland and Agric. Soc., Scotland.* 5th Ser., Vol. XXX. 1918. Pp. 97-125.

WADSWORTH, A. B. "A Study of Experimental Organizing Pneumonia." *Journ. Med. Res.* Vol. XXXIX., No. 2. November 1918. Pp. 147-151.

"Whereas the pneumococcus in pure culture gave rise in the dog to exudative processes which in all respects resembled those of man, and which, like those of man, underwent complete resolution leaving little or no trace of the disease; and whereas the staphylococcus in pure culture gave rise to circumscribed areas of broncho-pneumonia in which resolution was delayed or was followed by some interstitial bronchial pneumonia; it was only in the diffuse exudative lesions of the dog's lung incited by the pneumococcus and the staphylococcus together that resolution was regularly delayed and typical lesions of intra-alveolar organisation were seen."

WAKSMAN, S. E. "Studies in the Metabolism of Pathogenic Actinomycetes (Streptothrixes). I." *Journ. Inf. Dis.* Vol. XXIII., No. 6. December 1918. Pp. 547-554. 3 Tables.

"Blood agar is a very good medium for the growth of pathogenic actinomycetes, a good growth being obtained in twenty-four to seventy-two hours when incubated at 37° C. The production of haemolysis of the blood on blood agar, the liquefaction of blood-serum, the clotting and subsequent peptonisation of the milk, the liquefaction of gelatin, run parallel; the organism that produces most haemolysis produces liquefaction of the blood-serum and gelatin, and a greater digestion of the milk proteins; the organism that does not produce haemolysis of the blood does not liquefy the blood-serum and the gelatin, does not clot the milk, and has only a small action on the milk proteins. These characters can be used advantageously in the identification and classification of the actinomycetes. Some pathogenic actinomycetes grow readily on synthetic mediums."

WENGER, F. "The Structure, Function, Differentiation and De-Differentiation of Epithelium in Normal Tissue and in the Isolated State" (Über Bau und Funktion, Differenzierung und Entdifferenzierung des Epithels im normal-anatomischen Zellgewebe und im isolierten Zustand). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 11. November 1918. Pp. 497-547. *Ibid.* No. 12. December 1918. Pp. 561-614.

PHARMACOLOGY AND THERAPEUTICS.

CARNOT, P. "The Present Position of Antiseptics" (*Rapport sur l'état actuel de la question des antiseptiques*). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1166-1192.

In both external and internal antisepsis one should renounce direct antiseptics and use those indirect antiseptics the properties of which are only active at the moment of action.

CULLEN, G. E., and TAYLOR, H. D. "Relative Irritant Properties of the Chlorine Group of Antiseptics." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 681-699. 3 Plates (5 Figures), 2 Text-Figures. 8 Tables.

"0·5 per cent. sodium hypochlorite solution from which most of the calcium has been precipitated and calcium hypochlorite solution of equivalent hypochlorite concentration are only slightly irritating. Two per cent. chloramin-T solution has no irritant action. Five per cent. dichloramin-T in chlorcosane, and chlorcosane alone, irritate rabbit ears to a slight degree only."

FOURNEAU, E., and DONARD. "Chloride of Iodin" (*Sur le chlorure d'iode*). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1192-1196.

Solutions of chloride of iodin have a certain efficacy only at the time of their preparation. In watery solutions the trichloride of iodin instantaneously decomposes into iodic acid and monochloride of iodin. The latter salt therefore should be employed. To ensure the stability of monochloride of iodin, 10 per 1000 of salt should be added to solutions. To have the monochloride as pure as possible, and to utilise the iodin at its maximum, the best method of preparation is to add slowly hydrochloric acid to a solution of iodide of potassium in *eau de Javel*.

HAMILTON, H. C. "The Comparative Values of Some Local Anesthetics." *Journ. Lab. and Clin. Med.* Vol. IV., No. 2. November 1918. Pp. 60-68. 9 Tables.

MONVOISIN, A. "Galactagogues" (*Les galactagogues*). *Rec. Méd. Vét.* Vol. XCIV., No. 21. 15th November 1918. Pp. 573-587. 4 Tables, 2 Charts.

After testing numerous so-called galactagogues, the author concludes that, in all species, mechanical excitation of the mammary gland with as complete emptying as possible, and the best feeding, are the only real galactagogues.

PHYSIOLOGY.

CAZALBOU, L. "A Problem in Physiology, apropos of Death from Cold" (Un problème de physiologie, à propos de la mort par le froid). *Rec. Méd. Vét.* Vol. XCIV., No. 21. 15th November 1918. Pp. 571-573.

SERGENT, E., and LHÉRITIER, A. "The Rectal Temperature of the Dromedary" (Note sur la température rectale des dromadaires). *C. R. Soc. Biol.* Vol. LXXXII., No. 4. 22nd February 1919. Pp. 172-175. 5 Charts.

The rectal temperature of the dromedary is one of the lowest in mammals. The average is 37° C. It is subject to very considerable variation. The most sudden and marked diminution occurs when the animal is exposed to rain. This is not caused by the general cooling of the atmosphere, but is due to the wetting to which the dromedary appears particularly sensitive.

POULTRY DISEASES.

ARCHIBALD, R. G. "A Mycosis of Turkeys." *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 257-260. 4 Figures.

BEACH, B. A., and HALFIN, J. G. "Observations on an Outbreak of Favus." *Journ. Agric. Res.* Vol. XV., No. 7. 18th November 1918. Pp. 415-418. 1 Plate.

"Favus is primarily a wound-infection disease of the unfeathered parts of the head. It occurs usually as an enzootic. An ointment composed of vaselin and formaldehyde is an effective remedy. Infection by the digestive tract is impossible. Intravenous inoculations are incapable of starting infections. The organism (*Achorion schinleinii*) isolated and studied by us is specific, as shown by the fact that typical cases of the disease were produced in hens inoculated with laboratory cultures."

EVE, H. B. "Fowl Cholera." *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 28-29.

HADLEY, P., ELKINS, MARGUERITE W., and CALDWELL, DOROTHY W. "The Colon-Typhoid Intermediates as Causative Agents of Disease in Birds. I. The Paratyphoid Bacteria." *Bull. 174. Agric. Exp. Station, Rhode Island State Coll.* May 1918. Pp. iv. + 216.

SEROLOGY AND IMMUNOLOGY.

BRODIN, P., LOISEAU, G., and SAINT-GIRONS, F. "The Antitoxic Power of the Serum and Plasma of Horses used for the Production of Antitetanic and Antidiphtheritic Sera" (Pouvoir antitoxique du sérum et du plasma chez des chevaux producteurs de sérum antitétanique et de sérum antidiphthérique). *C. R. Soc. Biol.* Vol. LXXXII., No. 4. 22nd February 1919. Pp. 159-161.

The antitoxic properties of the serum and of the plasma are appreciably equal.

DEBAINS, E., and NICOLAS, E. "The Cause of Death in Horses Immunised with Killed Bacteria or Bacterial Extracts" (Sur les causes de la mort chez les chevaux immunisés avec les bactéries tuées ou les extraits bactériens). *C. R. Acad. Sci.* Vol. CLXVIII., No. 6. 10th February 1919. Pp. 324-327.

The writers' experience shows that immediately fatal accidents are manifestly due to hypersensitivity to microbial toxins.

Goss, L. W., and SCOTT, J. P. "Standardisation of Blackleg Vaccine." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 234-243. 8 Tables.

HERRMANN, S. F. "Liberation of Antibodies on Injection of Foreign Proteins." *Journ. Inf. Dis.* Vol. XXIII., No. 5. November 1918. Pp. 457-469. 5 Charts.

In rabbits sensitised with streptococci a definite liberation of specific opsonins and agglutinins follows the injection of foreign protein. A variety of foreign proteins can be used. Human serum, typhoid vaccine, human ascitic fluid, and guinea-pig serum proved equally efficacious. The conclusion is that the intravenous injection of foreign protein serves as a stimulus for the liberation of specific antibodies in animals in which the previously injected antigen is unable to cause such a liberation.

LIGNIÈRES, J. "Vaccination against 'Tristeza'" (Sobre la vacunación contra la "Tristeza"). *Revista Zootecnica.* Vol. VI., No. 63. December 1918. Pp. 245-249.

QUÉRY, L. "The Presence of Specific Antibodies in the Serum in Parasitism" (À propos de la présence d'anticorps spécifiques dans le sérum sanguin d'animaux parasites). *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 15 (15)-16 (16).

RICHET, C., BRODIN, P., and SAINT-GIRONS, F. "Blood Phenomena in Anaphylaxis and Antianaphylaxis" (Des phénomènes hématiques dans l'anaphylaxie et l'antianaphylaxie (crise hemo-anaphylactique)). *C. R. Acad. Sci.* Vol. CLXVIII., No. 8. 24th February 1919. Pp. 369-376. 3 Figures.

Three new phenomena have been observed in experiments on dogs:—
(1) Nucleated erythrocytes appear in the blood; (2) the blood becomes more concentrated; and (3) there is a variation in the leucocytic formula.

SALSBERRY, C. E. "Observation on the Use of Biological Products." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 244-250.

Briefly summarises the results of the application of biological products (sera, vaccines) in swine fever, haemorrhagic septicæmia, influenza, blackleg, and abortion.

SHERMAN, H. W. "Antibodies in the Fetus." *Journ. Inf. Dis.* Vol. XXIV., No. 1. January 1919. Pp. 1-8. 5 Tables.

"The scope of this paper is confined to a study of the natural antibodies of swine embryos. . . . In the youngest embryos complement and lysins are inappreciable. Opsonins were present, but averaged only 0·04 as measured by the opsonic index. Complement and opsonins increase as the age of the foetus increases. Lysins do not appear to increase. In the amniotic fluids complement is only occasionally found; lysins and opsonins resemble closely those of the foetal serums. The conclusions of Polano and Goldmann from their work, respectively, on antitoxins and vital stains, that the amnion has a selective secretory action, seems to be unwarranted. The theory of the transudation of amniotic fluid from the maternal serum is untenable. The amniotic fluid is probably derived exclusively from the surface of the foetus. In the allantoic fluids complement was found only in the younger embryos. Lysins are found more prevalent in the earlier fluids, but to a small extent also in the later."

SURGERY.

BELL, W. M. "Some Important Points in Castration and Spaying." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 624-627.

BURNS, G. H. "Lameness of Obscure Origin and Some of its Causes." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 3. December 1918. Pp. 217-222.

"Abnormal conditions within the foot are, in my opinion, responsible for at least 50 per cent. of all cases of obscure lameness."

BROWN, W. "The Care of the Horse's Hoof." *Scottish Journ. Agric.* Vol. II., No. 1. January 1919. Pp. 30-34. 1 Figure.

CAZIN, M., and KRONGOLD-VINAVER, S. "Antiseptics in the Treatment of Infected Wounds" (De l'emploi des antiseptiques dans le traitement des plaies infectées). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1214-1217.

The authors have had good results from the use of the polyvalent serum of Leclainche and Vallée in the treatment of wounds infected with streptococci.

CHÉNIER, G. "Treatment of Ocular Disease in a Dog by 'abcès de fixation'" (Traitement d'une affection oculaire par abcès de fixation). *Rev. Path. Comp.* Vol. XVIII., No. 151. December 1918. Pp. 9 (269)-10 (270).

— "A New Treatment of Cystic Tumours" (Nouveau traitement de la grenouillette). *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 16 (16)-17 (17).

After emptying the cyst, Chénier injected oxygenated water in two cases in dogs.

FOSTER, J. P. "Some of the Operative Steps in the Removal of the Ovaries of the Bitch." *Amer. Journ. Vet. Med.* Vol. XIV., No. 1. January 1919. Pp. 13-15. 1 Figure.

FRANC. "Pyotherapy" (Pyothérapie. Son emploi en campagne. Considérations nées de l'expérience). *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 21st November 1918. Pp. 469-481.

GOFTON, A. "Hæmatoma of the Neck." *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 25-28.

"This condition, the results of bites, has been of common occurrence in France amongst the horses of the British Army. It is usually located in the lower third of the neck, and not infrequently encroaches in some degree on the seat of the collar. Occasionally a hæmatoma is present on each side of the neck. It is more common in mares than horses." The operation for the total extirpation of the tissues involved is described.

[See also H. Kirk, "Bacterial Infection of Wounds in France," *Vet. Record*, 1918, xxxi. 125-126; and J. F. Taylor, *ibid.*, 165 (this *Review*, 1919, III. 130, 132).]

HENDERSON, W. W. "Gangrenous Dermatitis." *Vet. Journ.* Vol. LXXIV., No. 12. December 1918. Pp. 435-437.

"The local lesion is a necrotic gangrenous wound of variable size, met with usually in the region of the heel; there is a very persistent foul-smelling purulent discharge of a greyish colour, in which may be found small particles of dead tissue. The edges of the wound are rugged, not well defined, and of a necrotic character. The gangrenous necrosis spreads with alarming rapidity. For this purpose (the arrest of necrosis and gangrene) I have found the application of pure turpentine to the wound and the removal of all loose tissue to have a most marked effect."

LATARJET, A., and PROMSY, G. "The Antiseptic Action of Ionisation in Wounds" (De l'action de l'ionisation dans les plaies de guerre). *C. R. Soc. Biol.* Vol. LXXXI, No. 23. 16th December 1918. Pp. 1230-1235.

In point of view of antisepsis, ionisation has given very satisfactory and very encouraging results in the treatment of recent and old wounds, in spite of the weakness of the current employed.

LEHMANN-NITSCHE, R. "Native Operations on the Penis of the Horse in Latin America." *Revista Soc. Med. Vet.* Vol. III., No. 10. August 1918. Pp. 361-365.

In Latin America there exists the custom of mutilating the penis of the horse in order to prevent fecundation. The various operations and the districts in which they are performed are given in this paper.

LIGNIÈRES, J. "Bacteriotherapy in the Treatment of Wounds" (La bacterioterapia en el tratamiento de las heridas). *Revista Zootecnica.* Vol. VI., No. 63. December 1918. Pp. 220-222.

A paper presented at the meeting of the Société Centrale de Médecine Vétérinaire on 4th November 1916.

— "The Treatment of Wounds with Normal Horse Serum" (El tratamiento de las heridas por el suero normal de caballo). *Revista Zootecnica.* Vol. VI., No. 62. November 1918. Pp. 150-153.

MELTZER, S. J. "The Application of a Concentrated Solution of Magnesium Sulphate to Scalds and Burns." *Journ. Pharmacol. and Exp. Therap.* Vol. XII., No. 4. November 1918. Pp. 211-214. 2 Figures.

"First and second degrees of burns are invariably arrested in their development when molecular solution of $MgSO_4$ has been applied early. Third degree of burns ran, as a rule, a more favourable course under application of $MgSO_4$ than under any other treatment. Higher concentrations than 25 per cent. seem to exert a still better influence."

MESTREZAT, W., and CASALIS, T. "Antiseptic Properties of Monochloride of Iodin" (*Propriétés antiseptiques et mode d'emploi du monochlorure d'iode*). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1196-1199.

In wounds dressed with a solution of monochloride of iodin, large pale granulations, sometimes even greyish and impregnated with pus, are replaced by a red and finely granular surface, such as is present in healthy wounds. Arrested epidermisation becomes active.

PFULB and FAURE-FREMIET. "Paraffin Dressings in Infected Surface Wounds" (*Action des pansements paraffinés sur l'infection des plaies en surfaces*). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1221-1223.

Paraffin dressings may be aseptic, but they are not antiseptic, and it appears difficult to effectively incorporate in them bactericidal substances.

PRATT, E. F. "Treatment of Wounds by Paraffin." *Brit. Med. Journ.* No. 3035. 1st March 1919. Pp. 243-244.

"In face of such results I need no apology for urging the claim of soft paraffin as a dressing, and I feel sure that what has been found to be so good in minor injuries has every chance of being equally good in major cases."

QUITMAN, E. L. "Value of Ether in Wound Treatment." *Amer. Journ. Vet. Med.* Vol. XIII., No. 12. December 1918. Pp. 622-623.

The author knows of no more efficacious treatment for infected "open-joint" than the liberal injection of strong ether. Pure ether causes no irritation, and is far more efficacious than iodin injections.

REGAUD, C. "Mechanical Cleaning of Recent Wounds by Artificial Serum under Pressure" (*Procédé de nettoyage mécanique des plaies récentes par le sérum artificiel sous forte pression (Brossage hydraulique)*). *C. R. Soc. Biol.* Vol. LXXXI., No. 23. 16th December 1918. Pp. 1223-1227. 1 Figure.

Describes an apparatus consisting of an autoclave and a cooler, by which a jet of normal saline (8 per 1000) can be sprayed upon a wound in order to clean it.

SAVAGE, A. "A Method of Enucleating the Eye." *Vet. Journ.* Vol. LXXV., No. 1. January 1919. Pp. 24-25.

"The object of the technique here outlined is the removal of the globe of the eye and its attachment within the orbit, as well as the whole of the conjunctival membrane. As a result it aims at leaving the orbit lined by the inverted lids joined together at their margins."

SCHWENDIMANN, F. "Sprain of the Biceps Tendon, and Intertubercular Bursitis in the Horse" (Die Entspannung der Bizepssehne bei Bursitis intertubercularis des Pferdes). *Schweizer Arch. f. Tierheilk.* Vol. LX., No. 12. December 1918. Pp. 614-616.

The author thinks that lesions of the tendon of origin of M. biceps brachii, and inflammation of the associated intertubercular bursa, are responsible for obstinate, recurrent, and incurable cases of shoulder lameness.

— "Inguinal-Scrotal Hernia of the Horse" (Zur Inguinal-Skrotalhernie beim Pferd). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 2. February 1919. Pp. 82-91.

STOWELL, T. E. A. "Acriflavine Emulsion as a Wound Dressing." *Brit. Med. Journ.* No. 3035. 1st March 1919. Pp. 244-245.

The writer has shared the disappointment which many surgeons have experienced in the results gained from using 1 in 1000 solution of acriflavine in normal saline. He believes that on this account many surgeons have ceased to use flavine. In place of the solution he recommends the following emulsion :—

Acriflavine	0·1
Thymol	0·005
White wax	4·0
Liquid paraffin	76·0
Distilled water	20·0

TAYLOR, H. D., and STEBBINS, M. G. "The Action of Chlorinated Antiseptics on Blood-Clot." *Journ. Exp. Med.* Vol. XXIX., No. 1. January 1919. Pp. 125-131. 9 Tables.

"This work demonstrates that the chlorinated antiseptics have no power to penetrate blood-clots and destroy bacteria therein contained. Correspondingly, blood-clots may protect virulent bacteria for a long period of time and the organisms properly planted will be able to proliferate in a normal manner." "It seems probable that the fibrin of the blood-clot is the resistant substance, as plasma and red and white cells are easily dissolved by these antiseptics."

TERATOLOGY.

CROCKER, W. J. "Monstrosities." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 387-388. 4 Figures.

A brief description of cephalothoraco-omphalopagus in a pig, congenital internal hydrocephalus in a calf, and diprosopus in a calf.

DALO, F. "A Mandibular Teratoma" (Teratoma mascellare). *Il Moderno Zootro. Parte Sci. Ser. V.*, Vol. VII., No. 11. November 1918. Pp. 236-239.

A teratoma attached to the base of the neck (at the beginning of the dewlap) of an ox contained a mandible of irregular conformation.

HUNT, R. H. "Absence of One Kidney in the Domestic Cat." *Anat. Record.* Vol. XV., No. 5. December 1918. Pp. 221-223. 2 Figures.

A male cat lacked even the slightest vestige of a kidney on the right side of the body, though an adrenal, testis, and a very short ureter were present on this side. The left kidney was greatly hypertrophied.

TOXICOLOGY.

"A Case of Ergotism." *N. Z. Journ. Agric.* Vol. XVII., No. 5. November 1918. Pp. 263-264. 2 Figures.

In a young bull "the whole of the soft tissues of the leg had become dead and mummified below a point a little distance above the fetlock, leaving the bone exposed for nearly an inch in length. . . . This case, occurring as it did towards the end of winter, supports the opinion formed as a result of a series of experiments carried out in 1911 and 1912 at the Wallaceville Laboratory, namely, that ergot is most potent in its action during the winter months, when the process of spore-formation is proceeding in it."

GALLAGHER, B. A. "Experiments in Avian Toxicology." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 337-356.

The experiments were undertaken for the purpose of determining the toxic doses for fowls of the more commonly used medicinal agents, and of the poisonous substances to which fowls not infrequently have access. "In general, fowls may be considered as having approximately the same susceptibility to toxic substances as medium-sized dogs. They are more resistant to such substances as calomel, strychnine, and tartar emetic, and less resistant to carbolic acid, salicylic acid, and potassium cyanide. In treating outbreaks of disease in fowls, it is of great advantage to employ the drinking water as a vehicle for medicinal agents."

GHOSH, M. N. "Notes on the Hydrocyanic Acid Content of *Jowar* (*Andropogon sorghum*)."*Agric. Journ. India.* Vol. XIV., No. 1. January 1919. Pp. 107-115.

"It would appear that the weather is mainly responsible for the development of the poisonous elements in the *jowar*. The soil is only of minor

importance and is accountable only so far as it can hold up nitrogenous food materials to the plant. Brunich in Queensland found that the poisonous properties of *jowar* increased with improved fertility, and Treub stated that nitrates exert a direct influence on the production of hydrocyanic acid. Against this there are American results that in a rich soil, however well provided with plant food, an addition of nitrogenous fertilisers has been found to exert no appreciable effect, while in a poor soil there appears to be an increase, though to a slight extent."

MARSH, C. D. "Stock-Poisoning Plants of the Range." *Bull.* 575. U. S. Dept. Agric. 1918. Pp. 24. 30 Plates.

Contains descriptions of the important poisonous plants on the ranges of the United States, with directions for their avoidance and the treatment of affected animals.

MARSH, C. D., CLAWSON, A. B., and MARSH, H. "Oak-Poisoning of Live Stock." *U. S. Dept. Agric., Bureau Animal Industry.* 1918. P. 3.

SAMMARTINO, S. "The Poisonous Serpents of the Argentine Republic" (*Serpientes venenosas de la República Argentina*). *Revista Soc. Med. Vet.* Vol. III., No. 9. July 1918. Pp. 289-330. *Ibid.* No. 10. August 1918. Pp. 337-360. *Ibid.* No. 11. September 1918. Pp. 389-400. *Ibid.* No. 12. October 1918. Pp. 452-458. 31 Figures.

An exhaustive clinical and experimental study which does not lend itself to abstraction. The experiments show the great importance of the situation of the bite in relation to prognosis and treatment. A bite by *Lachesis alternatus* on the head of a horse produces a severe intoxication, and treatment with serum is only efficacious when applied not more than three hours after the bite has been inflicted. Therapeutic intervention is more efficacious when the bite has been inflicted on the limbs. In all cases 40 c.c. of serum should be used.

SIMMONDS, J. P. "The Effect of Feeding Sugar upon the Esterase Content of the Blood-Serum and Organs in Phosphorus Poisoning." *Journ. Exp. Med.* Vol. XXVIII., No. 6. December 1918. Pp. 663-672. 2 Tables. "The Peptolytic Power of Liver, Spleen, and Kidneys in Poisoning by Phosphorus and Chloroform." *Ibid.* Pp. 673-679. 1 Table.

"Clear, filtered glycerol extracts of chopped liver, spleen, and kidney contain an ester-splitting ferment. The esterase content of extracts of the liver and spleen of normal dogs is reasonably constant. . . . The feeding of sugar does not prevent the increase in esterase in the blood-serum of animals poisoned with phosphorus. The esterolytic power of extracts of the kidney varies considerably in different dogs.

"Glycerol extracts of liver, spleen, and kidney contain an eretic ferment

capable of splitting peptone into amino acids. Poisoning by phosphorus appears to reduce the creptic power of the liver, and to a less extent that of the kidneys. Poisoning by chloroform appears to have no appreciable effect upon the creptase content of the liver, spleen, or kidneys. Feeding of sugar to normal animals has little or no effect upon the creptic power of the liver, spleen, or kidneys. Feeding of sugar before or after poisoning with phosphorus appears to prevent the reduction of creptic power of the liver."

WARTHIN, A. S., and WELLER, C. V. "'Mustard Gas' Poisoning. The Lesions of the Respiratory and Gastro-Intestinal Tracts Produced by Mustard Gas (Dichlorethylsulphide)." *Journ. Lab. and Clin. Med.* Vol. IV., No. 5. February 1919. Pp. 229-264. 28 Figures. "The General Pathology of Mustard Gas (Dichlorethylsulphide) Poisoning." *Ibid.* Pp. 265-306. 13 Figures.

"Dichlorethylsulphide ('mustard gas'), in liquid or in vapour form, even in very low concentrations, is an escharotic poison for animal tissues (skin, conjunctivæ, cornea, mucous membranes of respiratory and gastro-intestinal tracts) with which it comes in direct contact."

(See page 133 of this volume of the *Review* for an abstract of an article by the same investigators on the ocular lesions produced by "mustard gas.")

TUBERCULOSIS.

BOSSAN and GUIEYSSE-PELLISSIER. "The Penetration into the Healthy or Tuberculous Lung of Medicaments Injected into the Trachea" (Recherches sur la pénétration d'une substance médicamenteuse dans le poumon sain ou tuberculeux par injection trachéale). *C. R. Soc. Biol.* Vol. LXXXII., No. 4. 22nd February 1919. Pp. 148-149.

A substance injected into the trachea penetrates in a relatively short time into the finest ramifications of the air-passages, and may be rapidly absorbed. In a tuberculous animal the medicament thus reaches the lesions and comes into intimate contact with them. The writers would insist on the importance of this observation.

CALMETTE, A. "The Excretion of the Tubercl Bacillus by the Intestine and by the Bile" (Sur l'excrétion des bacilles tuberculeux par l'intestin et par les voies biliaires). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 2. February 1919. Pp. 60-67.

A short review of literature already published. It must be admitted that the tubercle bacillus is carried to the liver by the blood-stream and eliminated by the bile. Virulent bacilli, often in immense numbers, occur in the faeces, where they are a source of danger and play an important rôle in the dissemination of tuberculosis.

DE WITT, LYDIA M. "The Use of Gold Salts in the Treatment of Experimental Tuberculosis in Guinea-Pigs. XVIII. Studies on the Biochemistry and Chemotherapy of Tuberculosis." *Journ. Inf. Dis.* Vol. XXIII., No. 5. November 1918. Pp. 426-437. 3 Tables.

FIDLAR, E. "The Complement-Fixation Test in Tuberculosis." *Lancet.* Vol. CXCV., No. 4973. 21st December 1918. Pp. 844-847.

Out of 215 cases under the head of "clinically non-tuberculous," the fixation test was positive in 21·8 per cent

KIERNAN, J. A. "Tuberculosis Eradication." *Amer. Journ. Vet. Med.* Vol. XIV., No. 3. March 1919. Pp. 103-111.

The writer, who is Chief of the Tuberculosis Eradication Division of the Bureau of Animal Industry, suggests the following scheme:—"Herds of cattle which have been accredited by the State and Federal departments for a period of three years from and after 1st September 1918, and which have been annually tuberculin-tested by officials of those departments in accordance with the uniform plan, may be placed under the supervision of a private veterinarian approved of by the official in charge of live stock sanitary work in the State for a period of three years, at the expiration of which time all such herds shall be tuberculin-tested by a regularly employed State or Federal veterinarian. If any tuberculosis is found in any herd at that time, it shall continue under official supervision until the disease has been eradicated, and until such time as the herd has been found free by a tuberculin test, two years after which it may be placed under private supervision for three more years."

M'FADYEAN, J. "Tuberculosis in the Horse caused by Bacilli of the Avian Type" *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 225-256. 16 Figures.

"The number of cases of equine tuberculosis in which the characters of the bacilli in the lesions have been determined is still too small to warrant any attempt to estimate the proportion in which the different types occur. The facts already recorded, however, make it almost certain that the avian type is not the commonest one, since the present case is only the second of the kind, against fourteen cases in which the isolated bacilli have been certainly not avian."

MAGAZZARI, A. "Tuberculous Peritonitis in a Dog" (Contributo alla casistica della tubercolosi del cane. Peritonite tubercolare in una cagna). *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VII., No. 10. October 1918. Pp. 209-218.

MURPHY, J. B., and STURM, E. "Experiments on the *Rôle* of Lymphoid Tissue in the Resistance to Experimental Tuberculosis in Mice. III. Effect of Heat on Resistance to Tuberculosis." *Journ. Exp. Med.* Vol. XXIX., No. 1. January 1919. Pp. 35-40. 3 Figures.

"Mice with high leucocytic counts and increased activity of the lymphoid tissue induced by one exposure to intense dry heat exhibit a marked increase in the resistance to large doses of bovine tubercle bacilli as compared with that shown by control animals given a similar inoculation."

RAW, N. "Attenuation of Human, Bovine, and Avian Tubercle Bacilli." *Lancet.* Vol. CXCVI., No. 4984. 8th March 1919. Pp. 376-377.

"The object of this short paper is to demonstrate the effect of long-continued and regular subculturing of pure cultures of human, bovine, and avian tubercle bacilli on artificial media containing glycerin. This process has been continued without interruption for twelve years, and the cultivations are luxuriant and grow as readily as in the first year of subculturing. They retain all their characteristics and selective appearances, and can be easily identified as distinct types of tubercle bacilli."

SARTI, C. "Experimental Tuberculosis (Human and Bovine) in the Dog" (Riproduzione sperimentale della tubercolosi (umana e bovina) nel cane). *La Clinica Vet.* Vol. XLI., No. 22. 30th November 1918. Pp. 579-597.

SCHROEDER, E. C., and BRETT, G. W. "The Method of the Bureau of Animal Industry for Testing the Potency of Tuberculin." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 4. January 1919. Pp. 357-361.

TUTT, J. F. D. "Tuberculosis in a Horse: Enormous Enlargement of Liver." *Vet. Record.* Vol. XXXI., No. 1599. 1st March 1919. Pp. 287-298.

The history of a case of tuberculosis in a seven-year-old cart gelding. "Heart and lungs were sound. Liver enormously enlarged and cirrhotic; it weighed 102 lbs. Mesenteric lymphatic glands were tuberculous. The spleen and kidneys were normal."

VETERINARY REVIEW.

THE CENTENARY OF THE STETHOSCOPE.

JUST a hundred years ago a change—almost a revolution occurred in the diagnosis of pulmonary and cardiac diseases; for it was in 1819 that the stethoscope was introduced into practical medicine. Ofttimes discoveries are made because the accumulation of knowledge and material has attained such proportions as to render possible—almost inevitable—departures in a new direction. But in some instances the facilities have existed from time immemorial; and yet the discovering eye, or the fortuitous combination of circumstances, or both, has been lacking. Nowhere is this more apparent than in the case of Laënnec and his stethoscope. Paper, parchment, papyrus had been in familiar use for ages, before Laënnec, placed in a position of difficulty, converted one of them to a novel use. Sometimes, also, a discovery is made, possibly by pure accident, and the discoverer does not at once realise the value and full significance of his find. Laënnec seems to have been much in this position, for he himself says that he did not think it necessary to give even a name to so simple an instrument.

Born at Quimper in 1781, René Théophile Hyacinthe Laënnec served as a surgeon in the army, from 1799, before he had obtained his medical degree. Afterwards he worked under Corvisart, who occasionally adopted the method of immediate auscultation: thus we may assume he gained his introduction to a method of diagnosis with which his name is now inseparably conjoined. In 1816, while principal physician to the Hôpital Necker, he had occasion to examine a young woman with heart disease, whose mammary glands were developed to such a degree that he could get no satisfactory information either by percussion or palpation. Imme-

diate auscultation was impossible. Remembering that if one places the end of a short stick to one's ear, the scratching of a pin at the other end is heard quite distinctly, Laënnec rolled a sheet of paper tightly and put one end of the roll on the precordial region of the patient and the other to his ear. As he says, he was "as much surprised as satisfied to hear the cardiac sounds more clearly than he had ever heard them before!" Following up this discovery, he experimented with various materials and forms of the instrument, and finally produced a stethoscope of wood essentially the same as that in use up to the present day. The later developments, such as the binaural stethoscope and the phonendoscope, involving the application of the telephonic principle, are but logical developments of the original "rouleau de papier, fortement serré."

After much work and observation, Laënnec two years later communicated the results of his labours to the members of the Académie des Sciences, who received his statements "without enthusiasm"! The invention was regarded as more of a toy than an instrument of value. In 1819, he published his *Traité de l'Auscultation Médiate*, which was received by the medical profession with some suspicion, perhaps not unnatural, inasmuch as none could confirm or contradict, with any weight, the statements contained therein. It is probable that the invention would have been forgotten, had it not been that the array of new facts relative to thoracic diseases elicited thereby was too great to be ignored. But time brought honour to the book in which the invention is described, in the form of translation into many languages. It is not without interest to note that some of Laënnec's strongest supporters, such as C. J. B. Williams, J. Macgregor, and H. Riley, were British physicians.

In 1823, Laënnec was appointed to the Professorship of Medicine in the Collège de France, in succession to Hallé; and in the following year he changed to the Chair of Clinical Medicine. He was private physician to the Duchess de Berry. He died of heart disease in 1826.

R. SCOTT LITTLE.

AGOSTINO COLUMBRE.

A N article by Checchia¹ already noted in the Bibliography in this *Review* (Vol. III., No. 1, February 1919, p. 105) seems to merit some further notice.

Dr. Checchia calls attention to a Neapolitan edition of Agostino Columbre's *Opera de Manischalcia* printed in 1490. No previous veterinary historian has noted this, though the work is described by Lorenzo Giustiniani (*Saggio storico-critico sulla tipografia del Regno di Napoli*, 1793), and by M. Fava and G. Bresciano (*La Stampa a Napoli nel XV. Secolo*, 1911-13). The University Library of Messina possesses a well-preserved specimen of this most rare edition, and another is to be found in the Imperial Library at Vienna. It is one of the rarest of the incunabula, and was, so far as is yet known, the first veterinary work to be printed.

Dr. Checchia, in wishing to emphasise the importance of Columbre, takes the line that no critic outside Germany has given Columbre his proper place in the development of veterinary science. This is to do less than justice even to Italian veterinary historians, and it would appear that the author did not know of Moulé's work in France or of Smith's in England. The fact is that Ercolani (*Ricerche storico-analitiche sugli scrittori di Veterinaria*, Turin, 1851) devotes twelve pages to Columbre, and much of what Dr. Checchia writes was also noted by him. Dr. Checchia is quite wrong in attributing to Schräder-Hering (*Biographisch-literarisches Lexicon der Thierärzte, etc.*, Stuttgart, 1863) any kind of praise of Columbre, and the phrase quoted as coming from these German critics that Columbre was "one of the most brilliant figures of the fifteenth century," nowhere

¹ Checchia, N. "Un maniscaleo del '400." *Il Moderno Zootiatro*, Parte Sci. Ser. V., vol. vii., No. 9, September 1918, pp. 203-207.

occurs in their lexicon. On the other hand, Major-General Sir F. Smith (*Early History of Veterinary Literature*, vol. i. p. 125) reviews Columbre's work, and credits him with being an earnest observer and wide reader, and with originality in treating diseases. He quotes Ercolani, who states that Columbre was the first to describe diabetes in the horse, granular conjunctivitis, larvæ in the ears, haemorrhoids, and the existence of *Oxyuris curvula* in the rectum.

This latter point is of interest, for Railliet in his history of Oxyurosis (this *Review*, Vol. II., No. 2, May 1918, p. 139) mentions Goeze (1782) as being the first to describe and illustrate the Oxyuris of the horse. Columbre nearly three hundred years earlier (1490) mentions "a pruritus of the anus caused by minute and subtile worms living in the neighbourhood of the anus. If the tail be lifted up, they will be seen all about the dung, and can be removed by the hand." There is, of course, no proper description here of *Oxyuris*, beyond that they are "minute and subtile worms," but it is curious that though the parasites were thus plainly noticed as early as 1490, the first recorded description of them should not have been made until 1782. It is interesting to recall, in passing, that even in the *Mulomedicina* attributed to Chiron, a work pillaged by Vegetius in the fourth century A.D., the pruritus of the anus caused by these worms had been noted as causing "humours to be found near the anus like to a boiled bean: there is also a bloody matter . . . the horse rubs its tail on the walls."

Columbre seems also to have been the first writer to pay any attention to anatomy. He discussed "contorsio uteri" and other causes of maternal dystokia, and was the first to practise subcutaneous tenotomy and neurectomy, and to note the poisonous action of *Ferula communis* L in equines.

F. BULLOCK.

THE LIBRARY,
ROYAL COLLEGE OF VETERINARY SURGEONS, LONDON.

ABSTRACTS.

ANATOMY.

INNERVATION OF THE SUSPENSORY LIGAMENT (INTEROSSEOUS MUSCLE) AND NEURECTOMY OF THE DEEP BRANCH OF THE LATERAL VOLAR (METACARPAL) NERVE (L'innervation du ligament suspenseur du boulet et la névrotomie de la branche palmaire profonde chez le cheval). E. BOURDELLE. *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Med. Vét.* 3rd April 1919. Pp. 141-147. 2 Figures.

That the interosseous muscle (suspensory ligament) is richly supplied with nerves is evident from the acute symptoms evinced when the ligament is the site of pathological change. The nerve of supply is the deep branch of the lateral volar (metacarpal), which leaves the parent nerve slightly above and behind the proximal extremity of the fourth (outer) metacarpal bone. From this point the deep nerve runs downwards and forwards, under cover of the aponeurotic investment at the lateral aspect of the carpus, and beneath the ligament that stretches from the accessory (pisiform) bone to the small metacarpal bone, from which it is separated by the lateral volar metacarpal vein. It thus reaches the upper end of the suspensory ligament, between which and the carpal reinforcement of the deep flexor it insinuates itself. Here it divides into numerous filaments, most of which supply the suspensory ligament by entering between the bundles of its superficial stratum. Very small filaments are distributed to the rudimentary interosseous muscles. Two fine but remarkable branches descend on the posterior surface of the third metacarpal bone underneath the borders of the suspensory ligament, and may be followed as far as the metacarpophalangeal joint.

A question of some moment that the author had to settle was the exact composition of the deep branch of the volar nerve. As is well known, the lateral volar nerve itself is formed by fibres derived from both the ulnar and median nerves. Arguing from the facts of comparative anatomy, it might be assumed that the deep branch of the volar nerve would contain fibres derived from the ulnar nerve only.

The author, however, is satisfied that both the ulnar and median nerves are concerned in its constitution. This means, therefore, that, if it is desired to destroy the sensibility of the suspensory ligament, it will be necessary to sever both these nerves—a proceeding that would involve a multiplicity of structures in addition to the ligament. To overcome this undesirable wide destruction of nerve supply, Bourdelle recommends that the deep branch of the volar nerve should itself be sectioned, an operation that can be performed without undue difficulty if the exact position of the nerve is kept in mind.

PRESENCE OF AN ANTERIOR JUGULAR VEIN IN THE HORSE, ACCOMPANIED BY A JUGULO-CAROTID ANEURSYMAL ANASTOMOSIS (Présence d'une jugulaire antérieure chez le cheval, accompagnée d'une anastomose anévrismale jugulo-carotidienne). C. BRESSOU. *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 147-154. 2 Figures.

In a horse in which the right and left jugular veins were present and normal, a large vein was discovered ventral to the trachea, covered and completely surrounded by the sterno-hyoid and sterno-thyroid muscles. The accessory vessel took origin by two roots: one sprang from the external maxillary vein, and the other was a continuation of the sublingual vein. The vessel thus formed was connected by transverse anastomoses with the left jugular vein in the upper and lower fourths of the neck, and at the entrance to the chest it finally joined the left jugular.

The thyroid artery on the left side of the neck was represented by several vessels, two of which approached a slight dilatation of the supernumerary vein, and divided into very fine, flexuous arterioles. These opened into the vein and thus established an anastomotic relationship between the arterial and venous systems.

The author is of opinion that the accessory vein must be regarded as an anterior jugular, such as is present in the human subject.

CLINICAL.

ABOMASAL FISTULA IN A COW (Labmagenfistel bei einer Kuh). E. AUGSBURGER. *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 3. March 1919. Pp. 138-141.

According to Hutyra and Marek, abomasal ulcers in adult cattle are of very rare occurrence. The author herein describes a case as it was met with by him in a five-year-old cow, in which a fistula resulted.

From the history as supplied to him, he learned that a swelling slowly and gradually developed in the middle line of the abdomen just in front of the umbilicus and on a level with the first lumbar vertebra. At first it was small and hard, well-defined, and only slightly painful, and apparently produced no effect on the general condition of the animal. Three weeks before Augsburger was asked to see the case, the swelling ruptured and allowed the escape of ingesta.

At the time of examination the swelling was about 30 cm. in circumference, well-defined, dense, and moderately painful. In the centre of the swelling there was a fistulous opening, 40 cm. in width, with an irregular margin. Appetite and rumination failing, the animal was slaughtered.

On post-mortem examination it was discovered that the fistula communicated with the pyloric part of the abomasum, and that the greater curvature of this part of the stomach was adherent to the abdominal wall. In the immediate neighbourhood of the adhesion the peritoneum was slightly reddened, but elsewhere it was normal. In the interior of the abomasum, at the entrance to the fistula, there was a rounded ulcer of 9·5 to 11 cm. in diameter. The borders of the ulcer were everywhere sharply defined by a ring of smooth mucous membrane.

A CASE OF OSTEOMALACIA IN A PIG (Un caso de alteración constitucional de tipo osteomaláxico en el cerdo). R. SCASSO and E. CHARLES. *Revista Zootecnica*. Vol. VI., No. 65. February 1919. Pp. 348-350.

The case related in this article is that of a pig, aged three months, belonging to a litter of six animals, all previously healthy, kept for laboratory experiments. The first indication of illness in the young pig was a condition of malnutrition, though the appetite was good. About the same time it was observed that the gait was insecure, and that there was hyperesthesia, as elicited by placing the hand on the body. Shortly afterwards symptoms of osteomalacia became evident. The limbs were kept as rigid as possible, and any movement was accompanied by acute pain, as evidenced by the emission of querulous grunts. These symptoms became gradually more pronounced, and at the end of a month decubitus was permanent. Thirty days later, being *in extremis*, the pig was killed.

The cæcum contained rounded lesions in which was caseous material. The liver was of normal size, but resistant to the knife and with a thickened capsule. Microscopically there was an increase of connective tissue, with diminution in the size of the lobules and hepatic cells.

The spleen was sclerosed and also possessed a thick capsule. The kidneys were atrophic and deformed; their capsules were thickened and adherent, and the parenchyma was sclerosed. All the bones of the skeleton were deformed. The epiphyses of the long bones were enlarged, while the diaphyses were shorter than normal and curved. All the bones were soft and elastic; their medullary cavities were enlarged, and the bony material could be easily cut with a knife. In comparison with the stunted condition of the body generally, the size of the head was striking, for it was large enough to have belonged to an older animal.

The authors are in doubt as to the etiology of the condition, and consider that their case cannot be explained by current theories, seeing that the patient had been fed on the same food as the other laboratory animals.

DIETETICS.

GERMINATED OATS AS A FOOD FOR HORSES (*Alimentation des chevaux d'une formation sanitaire pendant les deux dernières années de campagne: Emploi de l'avoine germée*). A. SATRE. *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 17 (17)-19 (19).

The idea of feeding germinated oats to horses followed the success attained by the use of Bergame bread—"pain naturel de Fruges"—in Italy. This is made by steeping the whole-wheat grain for forty-eight hours in water at 20° C. and then grinding the swollen and softened entire grain into a paste ready for baking. Thus no bran offals are produced; and the bran coat, generally believed to be indigestible, is perhaps rendered less so. The proteins are in part hydrolysed to peptones and amino-acids, and the starch to dextrose and glucose. It is assumed that food which has been so modified is more readily and completely digested and assimilated. When strict economy was necessary in the feeding of horses, with resultant restriction of their rations, the author steeped the oats for sixty-two hours at 20° C., washed them with warm water over perforated trays, and allowed them to drain. The oats were then fed plain or with the addition of bran. During the process the grain became cleansed of dust and dirt which is said to cause intestinal trouble and broken wind. It is claimed that this method of treating the oats was very successful, the animals being kept in better condition than those of neighbouring formations given the same weight of untreated grain.

(R. G. L.)

THE NUTRITIVE VALUE OF "HAY SEEDS." R. G. LINTON. *Vet. Journ.*
Vol. LXXV., No. 2. February 1919. Pp. 58-60.

From the time hay is taken from the stack to its final distribution when fed to horses a considerable loss occurs from the shaking out of the seeds, fragments of stems, etc.

Such material, commonly referred to as "hay seeds," undoubtedly has a certain food value. If recovered in a clean state it should be a perfectly wholesome food, and in this respect should not be confused with loft-sweepings (see this *Review*, Vol. II., No. 4, p. 436). Trussed rye grass hay or rye grass and clover was found to yield, when well shaken, an average of 15 per cent. by weight of "seeds": meadow hay yields very little in comparison—about 3·4 per cent.

A mixed sample from rye grass, clover, and meadow hay was found to have the following percentage composition:—

Moisture	Crude Protein.	Pure Protein	Fat	Carbo-hydrate	Fibre.	Ash.
14·25	10·5	7·75	3·0	25·75	36·5	10·0

From this analysis it is assumed that the food value of "hay seeds" is as follows (the food values of loft-sweepings and meadow hay are given for comparison):—

	Calories per lb. Static	Calories per lb. Dynam.	Production Starch Equivalent
Meadow hay	769	513	30
"Hay seeds"	649	376	22
Loft-sweepings	700	427	25

"Hay seeds" cannot be described as a valuable food even when gathered under favourable conditions, and the above figures probably indicate its maximum worth.

AUTHOR.

FRACTIONAL FEEDING OF HORSES (Le régime des repas fractionnés chez le cheval de guerre). MARCENAC. *Rer. Gén. Méd. Vét.* Vol. XXVIII., No. 328. April 1919. Pp. 181-185.

This paper discusses the advisability of dividing the horse's daily ration into several feeds instead of feeding twice a day only, as is apparently the custom in the French army.

The conclusion arrived at is that the former method is much the superior even for normal healthy horses. For debilitated and anaemic horses and for those suffering from intestinal disturbances, such as gastro-enteritis, multiple feeds is especially recommended. The horses of many units, it is said, are only fed at 11 A.M. and 4 P.M., and it was found that these animals had colic very frequently, they were in poor condition, and their dung contained a high percentage of undigested oats.

The dung of a number of these animals was collected and mixed, and samples of 3 kilos weight were taken and sown over a square metre of good arable soil. Twenty-five days later the oat shoots were counted. The day following the sowing of the oats the horses were put on multiple feeds—six feeds divided between 6 A.M. and 6 P.M. The greedy feeders ate more slowly and chewed their food better, and symptoms of pica disappeared. The dung had a more healthy look, and obviously contained fewer whole oats, which was proved by a sowing, as was done at the beginning of the experiment. As the horses improved in condition the number of feeds was gradually reduced. Three feeds should be the minimum number.

(R. G. L.)

AN EXPERIMENT IN THE REARING OF CALVES ON WHEY AND MEALS.

Journ. Board Agric. Vol. XXVI, No. 1. April 1919. Pp. 39-51. 4 Plates.

On cheese-making farms the only by-product obtained from milk is whey, which, owing to its low nutritive value, is of little use for the rearing of calves unless supplemented with some other nutrients, and it is therefore usually given to pigs. Compared with whole milk, whey is deficient chiefly in albuminoids, fat, and mineral matter. It is shown by analysis that in order to bring one gallon of whey up to the food value of one gallon of whole milk there must be added 0·36 lb. of fat and 0·26 lb. of albuminoids. The addition of phosphate of lime is also desirable. Any added material must be concentrated and highly digestible in order that not too great a bulk need be given to obtain the requisite nutrient. Eight calves were used for an extensive experiment, the object of which was to determine what is the best foodstuff, or combination of foodstuffs, to add to the whey for the successful and economical rearing of calves. The report, which contains a deal of important matter, gives in a summary the following suggestions. Any of these meal mixtures, it is said, may be used:—(1) Linseed meal, 3 parts; linseed-cake meal, 2 parts. (2) Linseed meal, 2 parts; fish meal, 1 part. (3) Bean meal, 5 parts; linseed-cake meal, 4 parts. (4) Linseed meal, 3 parts; bean meal, 3 parts; fish meal, 1 part. (5) Linseed meal, 1 part; coconut meal, 1 part. (6) Linseed meal, 3 parts; fish meal, 1 part; ground oats, 3 parts. Of these, preference is given to the bean meal mixtures. The meal mixture should be used at the rate of 1 lb. to each gallon of whey, which should be warmed to blood heat. Half an ounce of precipitated bone phosphate should be added to each gallon of whey. From the age of four weeks the calves should be given hay *ad lib.*, and as soon as they will eat it, linseed cake or a mixture of linseed cake, coconut cake, and gluten feed, starting

with 2 ozs. and rising eventually to 8 ozs. per head. Should any digestive trouble in the form of "blowing" occur in the calves during the early stages of feeding whey, it can be successfully dealt with by adding a little precipitated chalk to the whey. As well as the above-mentioned mixtures, cod-liver meal was tried, but it was found to be so unpalatable to the calves that its use was abandoned. Included in the summary of the report is a detailed account of the system of feeding that is advocated.

(R. G. L.)

THE REGULATION OF THE INTESTINAL FLORA OF DOGS THROUGH DIET.
J. C. TORREY. *Journ. Med. Res.* Vol. XXXIX., No. 3. January
1919. Pp. 415-447. 9 Tables.

"It is now well known that diet exercises a profound influence on the determination of the types of bacteria developed in the intestinal tract. In fact, under conditions of normal physiological functioning within the digestive tube, it is a fundamental factor." In the experience of the author, the intestinal flora of dogs reacts very promptly and with great uniformity to changes in diet. This conclusion is diametrically opposed to that reached by Sisson (*Amer. Journ. Dis. Children*, 1917, xii, 117).

It was shown in the course of the experiment that, on the one hand, not all carbohydrates have an equal tendency to establish a purely fermentative intestinal flora, and, on the other hand, not all protein foods encourage putrefactive conditions in a like degree. Lactose and dextrin, when added to a meat and rice diet, caused such a marked development of aciduric bacteria of the *B. acidophilus* type as to almost completely dominate the faecal flora and effect the almost complete suppression of the proteolytic types. *B. bifidus* sometimes increases greatly under this diet, but was generally soon overgrown and suppressed by *B. acidophilus*. A diet of bread and milk was also followed by the establishment of a flora consisting almost entirely of *B. acidophilus*. With saccharose, maltose, and glucose this transformation did not occur or was far less striking.

With pasteurised milk some difference was noted, depending upon whether the milk was given unboiled or boiled. With unboiled milk, *B. coli* and streptococci and *B. acidophilus* were more numerous than other types of bacteria. Starchy foods all tended to simplify the flora and eliminate obligate putrefactive bacteria. White bread, potatoes, and beans all tended to cause a predominance of *B. acidophilus*, while rice was rather less effective as an anti-putrefactive agent.

Proteins of mammalian tissues were the only ones that markedly encouraged the growth and activity of the obligate putrefactive

bacteria. With a fish diet spore-bearing bacteria did not appear in the faeces in more than insignificant numbers, and there was an absence of the *B. welchii* types that constitute so large a part of the flora in connection with a meat diet. On the other hand, bacteria of the *B. coli* and *B. proteus* types were strongly predominant. Milk casein had less tendency to increase intestinal putrefaction than had meat protein. Vegetable proteins are in strong contrast to animal proteins, especially meat, in that they do not encourage the growth of putrefactive types of bacteria.

Fat appeared to play no part in determining the development of bacterial types within the intestine. The only effect of large amounts of animal fat was a reduction in the relative numbers within certain bacterial groups.

EFFECT OF CERTAIN GRAIN RATIONS ON THE GROWTH OF THE WHITE LEGHORN CHICK. G. D. BUCKNER, E. H. NOLLAU, R. H. WILKINS, and J. H. KASTLE. *Journ. Agric. Res.* Vol. XVI., No. 12. 24th March 1919. Pp. 305-312. 1 Plate (3 Figures), 3 Tables.

In a former paper the authors had presented evidence to show that the lysin content of the proteins of certain grain mixtures fed to White Leghorn chicks was the limiting factor in their growth. The experiments were open to criticism "because of the small number of chicks under consideration, the laboratory considerations governing them, and the possible inaccuracy in the numbers given for the amino-acid distribution of the grain mixtures fed." This experiment was planned so as to eliminate as far as possible these points of objection. One hundred and eighty White Leghorn chicks were used, divided into three lots which were kept under identical conditions except that their diets differed. The conclusions arrived at are:—That the proteins of rice, oats, barley, hominy, and gluten flour are inefficient in promoting normal growth in the White Leghorn chick; the results indicate that the proteins in the grains mentioned above have a retarding action on the development of the external sexual characteristics and their functions, which accompanies the arrested growth of the chicks; baking a grain mixture composed of equal parts of soy beans, wheat, wheat bran, sunflower seed, hemp seed and cracked corn, moistened with water, materially lowers its efficiency as a food, when all else entering into the diet is sufficient; the growth and development of any animal is largely dependent on its individual vitality, and for this reason it would seem desirable to use a large number in experiments on nutrition.

(R. G. L.)

NET ENERGY VALUES AND STARCH VALUES. H. P. ARMSBY and J. A. FRIES.
Journ. Agric. Sci. Vol. IX., No. 2. April 1919. Pp. 182-187.

"It is now accepted as a fundamental doctrine in animal nutrition that the prime function of food is to supply energy for the operation of the human or animal body, and that all its other diverse uses are essentially tributary to this main purpose." Extensive investigations have been conducted in which the attempt has been made to determine experimentally how much energy the various feeding stuffs can actually contribute toward the upkeep of the animal body. For Kellner's and the authors' investigations the same general methods have, in the main, been used, and the results have been in general accord. In the actual application of those results to practice, however, two quite diverse, although not fundamentally inconsistent, methods have been followed, with more or less resulting confusion. This paper is "an attempt to make clear what we, at least, conceive to be the relation between the two systems." Kellner's "starch values" are in reality disguised energy values. The two sets of values substantially parallel each other; it is in the method of expressing them for practical use in computing rations that the two systems diverge. The authors have expressed them directly in terms of energy (net energy values), using the large unit, the *therm* (1000 kilogram calories), to avoid the inconvenience of large numbers. Kellner used the equivalent amount of digested starch. Thus, if a sample of maize meal is found to have a net energy value of 85·2 thermis per 100 lbs. of the meal, Kellner would say that this quantity of meal is equivalent to 79·5 lbs. of digestible starch since, according to his investigations, 1 lb. of digestible starch has a net energy value of 1·071 thermis. The authors, in calling Kellner's starch value a mixed unit, say, "It attempts to express what are really quantities of energy in terms of matter, and it has always seemed to us an unfortunate and an unnecessary concession to established usage." Recent literature has shown that it has been the cause of much confusion of thought. The authors proceed to show how the real "starch value" has been confused with the so-called "carbohydrate equivalent," which latter expression, while stating what a food contains, fails to show what useful effect it can produce. A second misapprehension identifies Kellner's starch value with what has been called the "physiological heat value" or the "fuel value," or what the authors have designated the "metabolisable energy." It is pointed out that the special merit of Kellner's researches is that they determined the actual contribution a food stuff made to the body, showing that it was not only less than the carbohydrate equivalent but also less than the physiological heat value, as there is a considerable amount of energy expended in the mechanical

and chemical processes incident to the consumption, digestion, and assimilation of the food. Not only is the net energy less than the metabolisable energy but the two are not even approximately proportional; an example is given to demonstrate this point. Objection is taken to the dualistic system of maintenance and production values on account of the perplexing complications introduced into all comparisons of rations, and to the fact that the system lacks any experimental foundation. It is pointed out that of the metabolisable energy only a proportion actually contributes to the maintenance of the animal, the remainder merely increasing the heat production. Heat production is not an end but an incident of metabolism. The body usually does not metabolise because it must produce heat, but produces heat because it metabolises. In his later writings Kellner accepted this view and distinguished between thermic and dynamic energy, and pointed out that what is required for maintenance is not a supply of thermal energy equal to the minimum heat loss from the body, but a supply of dynamic energy sufficient to support the necessary bodily activities.

(R. G. L.)

GENERAL.

STOCK BREEDING IN MADAGASCAR. G. CARLE. *Internat. Rev. Sci. and Pract. Agric.* Vol. X, No. 1. January 1919. Pp. 1-11.

The best remedy for the shortage of stock in France is the introduction of live animals from other countries; and it appears that Madagascar, with its seven million head of live stock, is one of the most important and richest colonies that could at once furnish useful help to the mother country. It is opportune, therefore, that a review should now be made of the state of cattle-breeding in this French colony.

"All the domesticated animals are to be found in the island, but the cow will long be the most diffused, the most valuable, and best suited to utilise the special brush of the island. The Madagascar cow is really a zebu, and it might be developed into a special breed, although it is not native to the island. It is a brachycephalous animal of more than medium size, and has a more or less large hump on the withers. It has long horns, shaped like a lyre; the neck is slender and the dewlap well developed; the proportions of the trunk are shortened; the front quarters are ample, while the rear is somewhat defective and narrow, but the legs are slender and the skeleton light. The coat is a more or less dark tawny colour, often piebald; the skin is thick, the coat harsh. The Madagascar breed, on account of its small size, is very different

from our European breeds. The average height of the cow is 47 ins., varying from 44 to 49 ins.; the bull is 49 ins. high on the average, reaching as much as 76 ins. Small parents naturally only produce bullocks of low weight. The qualities of the Madagascar cow are all centred in the trunk, and, to be more precise, in the fore-quarters." The main defects of the animal are too short a trunk and too long a rump, while the legs are often not long enough. The chief defect lies in the poor development of the rump, where the first-class meat is almost entirely located. Their faculty for fattening, however, is astonishing, as is their resistance to the effects of bad weather and drought. To increase the milk yield, crosses have been made with European animals, and have produced humpless stock.

GENETICS AND HEREDITY.

THE INTERCROSSING OF SHEEP AND THE EVOLUTION OF NEW VARIETIES OF WOOL. J. COSSAR EWART. *Scottish Journ. Agric.* Vol. II., No. 2. April 1919. Pp. 159-169. 5 Plates (12 Figures).

The crossing of sheep with a view to improving simultaneously the quality of the wool and that of the mutton has for a long time been carried out in an intermittent manner; but no serious and continued effort has hitherto been attempted. As, however, rule-of-thumb work gives place to that based on a fairly definite understanding of known scientific data, so the prospect of improvement is removed from the field of possibility to that of probability. Experimental work in connection with fowls of "fixed" breed shows that of the varieties resulting from the interbreeding of first crosses some are also "fixed," that is, breed true. For certain reasons, the chief of which is that the modern breeds of British sheep are themselves the ultimate product of much crossing, this result does not follow so certainly in breeding with sheep.

The sheep of the island of Soay are probably of the most primitive and fixed type in the British Isles. Very hardy and extremely prolific, they have thick, very fine but short wool. They are, however, deficient in what may be called "mutton characters." Experiments made by crossing this breed with Southdowns show that it is possible quickly to produce a breed exhibiting in a useful degree the chief characteristics of both. The wool of this cross is especially fine and of good quality. Derbyshire, in ascertaining how far the wool of sheep conforms to certain laws of inheritance, showed it to be possible, by judicious selection and breeding of Southdown-blackface hybrids, to produce a strain with the hardiness of the latter, and very excellent wool.

Of the original wild sheep of Europe but few flocks exist to-day, and these only in isolated areas, such as the Shetland Isles, Western Siberia, and the Maritime Alps of France. They are mostly characterised by lack of "mutton characters," and by a short, very fine brown wool, which is, however, lacking in strength. Here again suitable crossing results in the production of a wool very strong, silky, and lustrous, capable of yielding fine fabrics, of forming a substitute for alpaca, and superior to the finest moorit wool produced in Shetland.

(R. S. L.)

INFECTIOUS DISEASES.

EPIZOOTIC LYMPHANGITIS.

1. "Polymorphisme et déterminisme morphogénique du cryptococco de Rivolta." A. BOQUET and L. NÈGRE. *Ann. Inst. Pasteur.* Vol. XXXIII., No. 3. March 1919. Pp. 184-190.
2. "Essais de sérothérapie d'une affection mycosique chronique (lymphangite épidémiologique des solipèdes)." L. NÈGRE and A. BOQUET. *Ann. Inst. Pasteur.* Vol. XXXIII., No. 4. April 1919. Pp. 269-274.
3. "Traitement de la lymphangite cryptotococcique par le sérum d'animal gnéri." TASKIN. *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 138-139.

1. In their earlier papers Boquet and Nègre have noted polymorphism of the cryptococcus of Rivolta. In pus obtained from the lesions of epizootic lymphangitis, the organism occurs in the form of ovoid or "petit citron" bodies, 3 to 5 μ in diameter, with hyalin protoplasm and a membrane of double contour. In cultures in artificial media the organism may be in the form of large spherical or ovoid elements, 8 to 12 μ in diameter, rich in fat droplets; or a mycelium, more or less developed, branched and segmented, and possessing a membrane of double contour; or as fine filaments with a simple wall. In order to elucidate this pleomorphism, the authors have grown the cryptococcus under different conditions of temperature, etc., and have arrived at the following conclusions:—When the temperature of the culture is lowered to the minimum of 15 to 18°, the organism develops in the form of a more or less elongated cylindrical mycelium. The surface of absorption increases in relation to the volume of the organism and the membranous envelope becomes thinner. When the temperature is raised to the optimum of 35 to 36°, and when the organisms are bathed in a liquid that they absorb in its totality, they assume the spherical or

ovoid form and become surrounded by a membrane of double contour. The temperature acts at one and the same time on the medium, by modifying its osmotic pressure, viscosity, and surface tension, and on the cells by exciting the zymotic functions of their protoplasm. The peripheral membrane of the organism appears to be a regulator of nutritive exchanges. It increases in thickness and becomes of double contour, or it undergoes thinning, in accordance with the intensity of the physico-chemical processes of development. In the body of the horse, the size of the organism undergoes reduction, its surface of absorption increases in relation to its volume, and the surrounding membrane maintains a double contour. Reproduction by budding is independent of aerobiosis.

2. Nègre and Boquet relate their experience in the treatment of epizootic lymphangitis by the administration of serum derived from a hyperimmunised horse. Latour (*Bull. Acad. Méd.*, 1918, lxxx. 141-143; see this *Review*, 1919, III. 172) has recently reported good results obtained by the injection of massive doses of serum taken from a horse cured of the disease; but Nègre and Boquet's experiments do not confirm all the conclusions of this investigator. A horse, cured of ulcerative lymphangitis and showing no evidence of epizootic lymphangitis, was hyperimmunised by the injection of increasing doses of cultures of the cryptococcus. The injections were subcutaneous, and made at intervals during a period of 118 days. The horse was bled fifteen days after the last injection of culture. The subcutaneous injection of increasing doses (25 to 40 c.c.) of the anti-cryptococcal serum thus obtained administered at 24- to 48-hour intervals to animals affected with epizootic lymphangitis, produced an amelioration of the symptoms during the first days of treatment; but this was followed by a marked aggravation of the diseased condition as shown by the appearance of new ulcers and an increase in the amount of suppuration. Of three horses thus treated, one died, and the condition of the other two was so aggravated that the injections were suspended.

Two other animals were treated in a modified manner. Small increasing doses (1st day, 1 c.c.; 2nd day, 2 c.c.; 4th day, 5 c.c.; 8th day, 10 c.c.; 15th day, 12 c.c.; 25th day, 12 c.c.; 32nd day, 15 c.c.) were administered intravenously. During the first twenty-four hours of this treatment the suppuration increased and new lesions appeared and burst after forty-eight hours. From the third day, indurated masses and cords began to be absorbed. The cryptococcus disappeared little by little from the pus, and cicatrisation of ulcers, of several months' standing, was effected with truly surprising rapidity. Six weeks after the commencement of the treatment, the general state of the horse was excellent, the suppuration almost nil, small ulcers had cicatrised, and other lesions, as large as the hand, presented a clean surface in process

of epidermisation. Of all the numerous methods of treatment that have been tried, the authors have never observed such encouraging results.

3. Taskin also has taken the opportunity to try the method of treatment of epizootic lymphangitis described by Latour. Though Taskin was able to use four horses only in his observations, the results obtained are not without interest. All the animals, save one, were in good condition, and the lesions were about the same in degree in all of them. The serum used was obtained from two horses recently and completely cured of the disease. Treatment began on 12th December 1918, and each affected animal received 100 c.c. of serum every four days—that is, on the 12th, 16th, 20th, and 24th December; a final dose being administered on the 5th January. The first two doses were given by the intravenous route: the others subcutaneously. Three of the horses were completely cured on the 20th January, and returned to service. The fourth horse, old and thin, did not appear to derive any benefit from the treatment, and was slaughtered.

ULCERATIVE LYMPHANGITIS.

1. "Recherches et expériences sur le lymphangite ulcéreuse des équidés." R. VAN SACEGHEM. *Bull. Soc. Path. Exot.* Vol. XII., No. 1. January 1919. Pp. 9-11.
2. "Preliminary Report on Ulcerative Lymphangitis in Horses of the A. E. F." A. H. STRAUSS and A. C. WIGHT. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 180-186.
3. "Contribution à l'étude de la lymphangite ulcéreuse." *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 329. May 1919. Pp. 233-243.
4. "Contribution à l'étude de la lymphangite ulcéreuse du cheval. Sa symptomatologie, sa thérapeutique et sa prophylaxie." G. MULLIE. *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January-15th February 1919. Pp. 34-50.
5. "Treatment of Ulcerative Lymphangitis by Vaccines made from the Preisz-Nocard Bacillus Prepared with Ethyl-Chloride." R. H. KNOWLES. *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 262-272.

1. The communication by Van Saceghem may be regarded as a continuation of a previous paper (*Bull. Soc. Path. Exot.*, 1918, xi. 683-685; see this *Review*, 1919, III. 38). He has observed that a slight attack of ulcerative lymphangitis, that is one in which there is little or no general reaction, predisposes to fresh infection with the Preisz-Nocard bacillus; while those cases in which a large abscess is produced,

with the accompaniment of febrile manifestations, rather favour a cure of the disease. He has concluded, therefore, that when the reaction is marked, certain antibodies with curative properties are formed. Acting on this assumption, he has injected horses under the skin of the neck with pure cultures of Preisz-Nocard bacilli, and has thus induced the rapid formation of an extensive oedema that becomes an abscess about the fifth day. When opened, the abscess contains a creamy-white pus, and heals with astonishing rapidity and without any special treatment. The inoculations produce a very marked leucocytosis and eosinophilia. His experiments lead him to recommend abscess-production by the introduction of virulent cultures, suspended in physiological saline solution, as a mode of curative treatment. It is necessary that this should be done as early in the disease as possible, and before a condition of sensitisation towards the Preisz-Nocard bacillus has been produced.

Local treatment is of importance because it is a valuable adjuvant to general treatment, and it prevents the horse affected with the disease acting as a propagator of the bacillus. The local treatment which has given van Sacghem the best results is the daily application of a concentrated alcoholic solution of picric acid to the ulcers, after they have been well washed.

The author has found that the Preisz-Nocard bacillus produces a fatal pseudo-tuberculosis in the mouse.

2. Strauss and Wight have come to the conclusion that there is a predominant form of contagious lymphangitis in which neither the cryptococcus of Rivolta nor the Preisz-Nocard bacillus is present. Streptococci were found by them in 61 per cent. of thirty-six horses; no other organism of any significance being found in these cases. They, therefore, regard the streptococcus as being the most frequent cause of ulcerative lymphangitis. Clinical appearances are not sufficient to differentiate the different forms of the disease: a bacteriological examination is necessary.

Many different forms of local treatment were tried, but the present routine treatment as practised by the writers consists in opening the abscesses and curetting them, followed by the daily application of dry antiseptic dressings. Excessive granulations are cauterised. By these means alone they have been able to obtain healing of the initial lesions in the majority of cases, but secondary lesions occurred in nearly all cases. By the use of a vaccine containing from four to ten strains of streptococci, a marked diminution in the number of relapses has been noted.

3. This is a *résumé* of some of the work done at the military research centre instituted at the Alfort Veterinary School towards the

end of 1917. It has been shown that without doubt the Preisz-Nocard is the specific agent in the causation of ulcerative lymphangitis of the horse; that it is possible to reproduce the disease experimentally by inoculation of very small doses of young cultures of the organism, preferably in association with some inert body such as powdered carbon; and that true symptoms of the disease scarcely appear less than a month after the injection of virulent material.

Investigation has been made into the degree of transmissibility of the disease. Healthy horses have been placed in the stalls previously occupied by animals suffering from the disease, and have been caused to stand in the dung of such horses. In no case has the disease been transmitted. It may be concluded, therefore, that direct contagion is a small factor in the spread of the disease in ordinary conditions.

Numerous experiments have been conducted in order to assess the value of the various methods of treatment that have been advocated by different writers. It was found that mallein produces an initial phase of lessened resistance, in which there is a slight elevation of temperature, increased suppuration, the appearance of new lesions, and even the awakening of cicatrised lesions. This phase is followed by one of improvement, but unfortunately the curative action of mallein is incomplete. Recrudescence of the disease is always to be feared. Tuberculin produces a similar effect. The repeated injection of Rivoltine (autolysed yeast) is powerless to effect a cure. Specific toxins obtained from cultures of the Preisz-Nocard bacillus, like mallein and tuberculin, induce a disquieting negative phase. Cicatrisation was ultimately produced with fair rapidity, but recrudescence occurred. Vaccins prepared by the action of ether or heat on cultures of the organism were no more efficacious: nor were living cultures themselves.

Various chemical substances and mixtures, such as sulphate of copper and carbonate of ammonium, the intravenous injection of sulphate of copper, arsenobenzene of copper, tartar emetic, iodin in oil, and the local injection of Lugol's solution, did not produce a permanent cure. The application of salicylic or lactic acid in lanolin and vaselin caused healing of superficial ulcers, but the curative results were only indifferent. Altogether, chemical agents gave only partial results.

In order to test the efficacy of serum an attempt was made to induce hyperimmunisation, but this was found to be impossible. The polyvalent serum of Leclainche and Vallée was used locally, and was found to aid in cicatrisation.

The injection of blood taken from animals reputed cured of the disease did not give the positive results that have been announced by authors. The passive congestion treatment (Bier), with or without the

injection of iodin, did not appear to produce favourable results; and cauterisation of the lesions was of little utility.

In short, the various methods of treatment that were tried proved themselves to be merely palliative.

The diagnostic value of the injection into the eyelid of a glycerin extract of pure cultures of the Preisz-Nocard bacillus was tested. Though a local reaction was obtained, it cannot be considered truly specific; for even in healthy animals a similar reaction was produced. The temperature is not affected in either the diseased or the healthy animal. It would, therefore, be premature to recommend this method of diagnosis.

4. Mullie gives certain details of treatment which he has tried in cases of ulcerative lymphangitis, according to the following methods:—Bacteriotherapy as suggested by Truche (see this *Review*, 1917, I. 384); autopsyovaccination (methods of Velu and Belin); the intramuscular injection of methylene blue; a combination of autopsyovaccination and the injection of methylene blue; a combination of bacteriotherapy and autopsyovaccination. The results obtained have made it difficult for him to arrive at any definite conclusion respecting the real efficacy of any of these methods of treatment. Each has produced rapid cures; but none has revealed an absolute efficacy. To assess the therapeutic value of these methods of internal treatment, the author thinks that further and systematic research is necessary.

5. Bacteriotherapy has been applied in the treatment of ulcerative lymphangitis by Montgomery,¹ Truche,² Watson,^{3, 4} and Hines,⁵ with varying degrees of success. In the method now described by Knowles the bacteria are killed with ethyl-chloride, and the results of his vaccinations show a considerable number of cures.

The vaccin employed was polyvalent, ten different strains of the Preisz-Nocard bacillus from typical severe cases of the disease having been subcultured on serum agar (10 per cent. of horse serum). The subcultures were made in 6-in. Petrie dishes, and incubated at 37° C. for forty-eight to seventy-two hours. The growth was removed by scraping lightly with an ordinary slide, and placed in a weighed watch-glass. The bacterial mass was weighed, put into a mortar, and emulsified with a few cubic centimetres of salt (0·75 per cent.) and carbolic acid (0·5 per cent.) solution. The emulsion was placed in a large tube with a rubber bung, and transferred to an ice-box. Another tube, containing as much water as the bacterial emulsion, with a thermometer inserted, was also placed in the ice-box. When the thermometer registered a temperature near freezing-point the ethyl-chloride (equal volume) was added to the emulsion, which was then left in the ice-box for forty-eight hours. The rubber bung was now replaced by

cotton-wool, and the tube placed in tepid water (25° to 30° C.) to drive off the ethyl-chloride. The emulsion was then diluted with salt and carbolic solution so as to give 5 milligrammes of bacteria per cubic centimetre. The vaccin was administered subcutaneously on the right and left sides of the neck alternately every seven days.

The author concludes that "(1) Treatment of ulcerative lymphangitis with Preisz-Nocard vaccines (ethyl-chloride) gives better results than treatment without. (2) In the treatment of ulcerative lymphangitis vaccines prepared by ethyl-chloride have given better results than the vaccines prepared by other methods. (3) Treatment of ulcerative lymphangitis by vaccines should be commenced as early as possible."

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- ² TRUCHE, G., "Traitement bactériothérapeutique de la lymphangite ulcéruse," *Ann. Inst. Pasteur*, 1917, xxxi. 209-214; "Traitement de la lymphangite ulcéruse, par la bactériothérapie," *Rec. Méd. Vét.*, 1917, xcii.; *Bull. Soc. Centr. Méd. Vét.*, 155-180 (*Review*, 1917, I. 384).
- ³ WATSON, E. A., "Report on Ulcerative Lymphangitis. Ulcerous Lymphangitis," *Vet. Journ.*, 1917, lxxiii. 382-396 (*Review*, 1918, II. 30).
- ⁴ WATSON, E. A., "Some Remarks and Suggestions on the Vaccine and Serum Methods of Treatment of Ulcerative Lymphangitis," *Vet. Journ.*, 1918, lxxiv. 170-175 (*Review*, 1918, II. 299).
- ⁵ HINES, A. J., "Notes on Treatment of Ulcerative Lymphangitis," *Vet. Journ.*, 1918, lxxiv. 199-202 (*Review*, 1918, II. 300).

TREATMENT OF THE INFECTIOUS LYMPHANGITES OF THE HORSE.

1. "Sur le traitement des lymphangites bacillaires et cryptococciques." TASKIN. *Rec. Méd. Vét.* Vol. XCV., No. 2. 30th January 1919. *Bull. Soc. Centr. Méd. Vét.* 9th January 1919. Pp. 37-40.
2. "Traitement des lymphangites contagieuses du cheval par le pyothérapie." BELIN. *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 20th February 1919. Pp. 73-93.
1. Following the suggestion made by Donnat (see this *Review*, 1918, II. 447) respecting the value of intramuscular injections of biniodide of mercury in the treatment of epizootic lymphangitis, Taskin has tried the method in four cases of ulcerative and two cases of epizootic lymphangitis. The solution used was made as follows:—

Biniodide of mercury	0·10 gramme.
Iodide of potassium	0·20 "
Physiological saline, sufficient to make 10 c.c.	

Intramuscular injections were made every second day for a week. The treatment was then suspended for a week, and afterwards repeated. Its efficacy appears to be demonstrated in the cases of epizootic lymphangitis, but was not so satisfactory in ulcerative lymphangitis. The author ventures the opinion that the difference in the results may possibly be accounted for by the fact that in cryptococcic lymphangitis the injections were made close to the lesions; whereas, the lesions in the cases of ulcerative lymphangitis being at the distal part of the limbs, the injections were necessarily made at a distance from them.

2. Belin again returns to the subject of the treatment of epizootic and ulcerative lymphangitis by means of pyotherapy. (For notes on his earlier papers, see this *Review*, 1917, I. 151; 1918, II. 27, 174.) In his present communication he suggests a new method of preparation of the pyovaccin. The pus is collected in a sterile flask, and to it is added one part by volume of ether. The mixture is vigorously shaken to dissociate the pus as much as possible, and to this are added six parts of solution of iodin (iodin, 1 grammie; iodide of potassium, 4 grammes; distilled water, 1000 c.c.). It is an advantage to filter through several layers of sterile gauze in order to remove the larger particles of pus. The pyovaccin is ready for use in half an hour.

In his experience the injection of the vaccin by the venous route has no advantages over subcutaneous administration. Intramuscular injection (into the muscles of the neck) does, however, avoid the production of those oedematous nodules which may persist for some time, especially in epizootic lymphangitis, and purulent reactions are thus reduced in frequency. The relative value of increasing, decreasing, and constant doses in epizootic lymphangitis is discussed, and the writer concludes that constant doses appear to give the best results. From his experience of a number of cases, short particulars of which are given, he asserts that pyotherapy controls chronic as well as acute cases of epizootic lymphangitis.

In cases of ulcerative lymphangitis, Belin has found that doses of 3 c.c. of the pyovaccin produce the most satisfactory result. He finds that the number of injections may be reduced, so that the first daily series (of 3 c.c.) need not be greater than four. Afterwards it is simple and advantageous to give an injection every five or six days, the dosage being 3 c.c., or a little more if this dose proves to be insufficiently efficacious. He has latterly adopted this technique, and has found that it gives entire satisfaction both from the point of view of results and simplicity.

OBSERVATIONS WITH REGARD TO THE ETIOLOGY OF JOINT-ILL IN FOALS.

Sir JOHN M'FADYEAN and J. T. EDWARDS. *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 1. March 1919. Pp. 42-71.

The bacteriological findings in thirty-seven cases of joint-ill are given. The routine method employed was the withdrawal of part of the liquid from the joint cavity by means of a sterile pipette, and the use of the fluid so obtained for making films for microscopic examination and to serve as seed material for cultures. The joint was subsequently opened with boiled instruments. Four groups of organisms were discovered, namely, streptococci, *Bacillus nephritidis equi*, *Bacillus abortivo-equinus*, and coliform bacilli. In twenty of the thirty-seven cases streptococci were the cause of the lesions. In morphology, staining reactions, capsule formation, cultural characters, sugar fermentation tests, agglutination tests, haemolytic properties, and pathogenicity, it was impossible to find any important differences among the joint-ill strains of streptococci, or between them and other streptococci isolated from cases of pneumonia, pleurisy, or strangles in horses. So far as the authors are aware, *Bacillus nephritidis equi* has not previously been recognised as one of the causes of pyæmia and joint-ill in foals, or indeed described as occurring elsewhere than in South Africa. This organism was apparently the sole cause of disease in four cases, and it was present in three others in association with other diplococci or coliform bacilli.

Bacillus abortivo-equinus was the cause of disease in two of the thirty-seven cases. *Bacillus coli communis*, or organisms closely resembling it, were cultivated from joints usually in association with other bacteria, which were probably responsible for the lesions. But in four cases it seems probable that the bacilli were actually the cause of the disease. In morphology and cultural characters these strains resemble the colon bacillus, but cross agglutination tests indicated that they differ from a typical strain of *B. coli* supplied by the Lister Institute.

TRANSMISSION OF FOOT-AND-MOUTH DISEASE TO MAN BY MILK (Note sur la transmission de la fièvre aphteuse bovine à l'homme par la consommation du lait). H. PETIT. *Rev. Path. Comp.* Vol. XIX., No. 152. January 1919. Pp. 7 (7)-8 (8).

In the village of Vlessart, in the canton of Anlier, Belgian Luxembourg, there was an outbreak of foot-and-mouth disease in cattle in which the symptoms were clearly defined—stomatitis with ulceration, periungual ulceration, and death in some severe cases. About five days after the beginning of the outbreak, Petit saw twenty cases (out of a

population of 300) in the human subject, all in houses to which diseased animals belonged. The onset of the illness in man was marked by obstinate headache, fever, often vomiting, and, in two cases, epistaxis. The temperature remained between 39° and 40° C. for three days, and then fell for one or two days. During the earlier part of the disease there was stomatitis, gingivitis, some redness of the tonsils, and foetid breath. In three cases towards the third day there were small circular ulcers of the gums, surrounded by a circle of inflammation. All the cases recovered in about a week.

The disease did not occur in a house the cows belonging to which had not foot-and-mouth disease. Nor did it occur in two other houses where the milk was not consumed by the inhabitants, but was given to the pigs.

BACILLUS NECROPHORUS INFECTION IN SWINE. H. R. SCHWARZ. *Amur. Journ. Vet. Med.* Vol. XIV., No. 2. February 1919. Pp. 51-54.

From investigations and a limited number of experiments made with material from various parts of the State of Illinois, it was found that if animals showing the most severe symptoms were selected from a herd and subjected to post-mortem examination, 50 per cent. or more of them did not exhibit necrotic lesions, notwithstanding the fact that clinical symptoms were as well marked in many of the cases as in those in which necrotic lesions really existed. In 50 per cent. of the cases it was possible to demonstrate the *Bacillus suisepcticus*; in a few cases hog cholera existed, and in some instances both swine plague and hog cholera were demonstrable.

Experiments in the transmission of necrobacillosis showed that this was possible only in pigs that had been already infected with hog cholera. It has been found impossible to transmit the disease to healthy pigs by exposure to infection.

In administering bacterin treatment to eight pigs from different herds affected with necrobacillosis, it was found that a *Bacillus suisepcticus* bacterin gave as good results as autogenous bacterins.

Post-mortem manifestations, the presence of swine plague and hog cholera in a large percentage of cases, and the results of bacterin treatment, seem to show that necrobacillosis, when the lesions are internal, and especially when they affect the lung and intestines, is a secondary disease following swine plague and hog cholera. Local necrobacillosis such as "bull-nose," necrotic stomatitis, canker of the feet, etc., may be primary, and due to abrasion that admits the *Bacillus necrophorus* and other organisms.

GLANDERS IN THE MULE (Contribution à l'étude clinique de la morve chez le mulet). CABAYÉ, COLLE, and LAMARQUE. *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 326. February 1919. Pp. 65-70.

As the result of some 500 post-mortem examinations of glandered mules, and of malleining some 10,000 remounts in a Greek dépôt, the authors conclude that two forms of glanders occur in the mule, namely, acute and chronic. Two noteworthy symptoms are frequently observed:—
 (i.) Seen from a short distance, the sick mule has something of the appearance of one affected with tetanus, the head being thrust well forward. Attempts to gather food from the ground are painful, so much so, that soon all effort is abandoned. Appetite is still good, but the insensibility to stimuli, marked later on, is as yet undeveloped.
 (ii.) Lameness of a fore-limb, especially marked at the trot, the affected limb showing nothing abnormal.

Malleining by the intradermo-palpebral method was unsatisfactory save when combined with (a) careful temperature checking, twice daily and for two days after the injection, and (b) controlling all thermal abnormalities by hypodermic injection. Two out of three cases were thus detected. While unwilling to say that there is no palpebral reaction among mules, the authors note that one-fifth of the animals gave no signs whatever—an absolute reaction being rare. It is, however, best to isolate any mule showing any ocular reaction. Some fifty mules showed a slight rapidly-healing ulcer at the point of injection, which, as none of the animals showed glanders at any time afterwards, was probably pyogenic in origin.

(R. S. L.)

SWINE FEVER.

1. "Secondary Invaders and their Relation to the Filtrable Virus." G. A. JOHNSON. *Amer. Journ. Vet. Med.* Vol. XIV., No. 5. May 1919. Pp. 214-218.
2. "Contribución al estudio de las epizootias suideas. El virus filtrable y el *Bacillus suiscepticus* como agentes etiológicos en la pneumo-enteritis infecciosa del cerdo." A. DELGADO. *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 4. April 1919. Pp. 165-172.
3. "Observations in Regard to Immunizing Young Pigs." R. R. BIRCH. *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 75-92. 12 Charts, 2 Tables.
4. "Studies on the Hyperimmunization of Hogs against Hog Cholera." M. DORSET, C. N. M'BRYDE, W. B. NILES, and J. H. RIETZ. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 259-280. 10 Tables. *Amer. Journ. Vet. Med.* Vol. XIV., No. 6. June 1919. Pp. 272-274.

1. Johnson contends that the present knowledge of the diseases of pigs is in a very chaotic state, and that the term "hog cholera" has been applied to a group of closely-associated diseases. "Each of these various diseases is due to specific micro-organisms, though frequently seen in combinations that produce quite similar symptoms and confusingly mixed pathological lesions. The most important of these is the filtrable virus. Most of the members of the haemorrhagic septicæmia and typhus groups that affect swine are usually not virulent, but under conditions not at present understood they may become very virulent. These diseases are most prevalent where the resistance of the animal has been lowered by unfavourable conditions, of which apparently the most common is an attack of the filtrable virus either artificially or naturally acquired. There is urgent need of a better understanding of the relations of these various diseases. In order that the best results may be obtained, it is essential that there should be close co-operation rather than antagonism among all parties concerned."

2. Delgado is of opinion that the doctrine that attributes the etiology of swine fever to a filtrable virus alone is not free from serious objections. In order to accept the doctrine in its integrity, it would be necessary to make an analysis of innumerable cases of spontaneous attacks of the disease. He holds that the inoculation of pure culture of *Bacillus suisepcticus* is capable of producing an experimental disease, clinically and anatomico-pathologically inseparable from infectious pneumo-enteritis; and he is firmly convinced that it is possible to induce a strong immunity against pneumo-enteritis by the use of *Bacillus suisepcticus* under suitable conditions.

3. Birch points out that individual pigs and individual herds present the widest and most surprising contrasts in respect of their susceptibility to swine fever. On the one hand sucking pigs may possess a high degree of natural immunity, while on the other hand pigs of the same age seem to have no immunity whatever. The young of immune sows are often susceptible, while the young of susceptible sows are sometimes immune. Experience shows that the uncertain natal immunity cannot be depended upon to protect the young of either susceptible or immune mothers until weaning time, and it also teaches that simultaneous treatment administered before weaning time does not always confer a lasting immunity. The practice has therefore arisen of giving young pigs serum alone, in order to produce a passive immunity that will protect them until they are old enough to receive simultaneous treatment. The administration of serum alone, followed later by the simultaneous treatment, Birch proposes to call the "follow-up" treatment, in order to prevent confusion in the use of the term "double" treatment, which is often used as synonymous with the simultaneous

treatment. Though there is much to recommend the follow-up treatment (which is practically indispensable in the scheme of immunising young pigs), doubt has been raised whether this method produces the same length of immunity as does the simultaneous treatment. The questions the author set himself to answer were: Does the passive immunity produced by serum alone interfere with the production of the active, lasting immunity that is sought when pigs are subsequently given simultaneous treatment? And, providing this interference does exist, how long must we wait after the administration of the serum alone before we can give the simultaneous treatment and be assured of a lasting immunity? To answer these questions he devised certain experiments, and from them he has arrived at the conclusion that passive immunity produced by serum alone does not prevent the establishment of active immunity by subsequent serum-virus treatment. This apparently holds good irrespective of the interval elapsing between the two treatments, and irrespective of the quantity of serum administered.

4. Dorset, M'Bryde, Niles, and Rietz detail observations they have made on the hyperimmunisation of pigs. Their results go to show that, in the production of anti-swine fever serum, an interval of at least seven weeks should be allowed to elapse between immunisation and hyperimmunisation. They believe that the most uniformly satisfactory results would be obtained by allowing at least three months to elapse between the two processes; for, as a rule, the ability of the hyperimmunised pig to yield a potent serum increases, within certain limits, as the interval between immunisation and hyperimmunisation increases. The ability of immune pigs to respond to hyperimmunisation to the desired degree, once acquired, remains unimpaired for at least a year. The simultaneous inoculation of non-immune pigs with serum and virus, was followed almost immediately by an immunity that enabled them to withstand enormous doses of virus blood administered intravenously within a day or two after simultaneous inoculation. There was, therefore, no evidence of a "negative phase" or state of hypersensitivity to swine fever following simultaneous inoculation. From experiments conducted, it appears that dilution and haemolysis of swine fever virus blood do not materially increase its antigenic power.

THE SWINE DISEASE SITUATION. C. H. STANGE. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 740-744.

In considering swine fever and kindred diseases of pigs, Stange thinks that, in accordance with present knowledge, they may be summarised as follows:—

"(a) Hog cholera caused by a filterable virus. When uncomplicated, lesions are almost exclusively of a haemorrhagic nature, and frequently very few lesions are present. Its course is acute and there is no known cure. It is by far the most contagious and fatal disease we have among swine, but can be effectively prevented by properly prepared and carefully administered serum. One attack or proper serum-virus treatment confers durable immunity.

"(b) Diphtheritic or necrotic enteritis (pseudo hog cholera, pig typhus, paratyphus of hogs, bacillary hog cholera, necrobacillosis, salmonellosis, etc.), which in the light of our present knowledge may be caused by one or more of the following organisms:—*B. suispestifer* (Salmon and Smith), *B. enteritidis* (Gartner), *B. coli*, *B. typhi suis* (Glasser), *B. volvoldaysen* (Damman and Stedefeder), *B. necrophorus*. . . . It is most frequently found in herds where some disease, condition of nutrition or other influence has caused a reduction in vitality and consequent decreased resistance of tissues. . . . There may be localised inflammatory oedema in the early stages. Later, however, the changes most often seen are localised ulcers covered with diphtheritic membranes, usually in the caecum. In some cases the process may extend to a large section of the lower portion of the small intestine and upper portion of the large intestine. The wall may become thickened and the intestine resemble in form a piece of garden hose.

"(c) Swine plague. This disease, usually pulmonary in form, is caused by *B. suispesticus*. As a primary disease it most frequently occurs sporadically and only occasionally may become enzootic."

CONTAGIOUS ABORTION.

1. "Studies in Abortion Disease." H. R. SEDDON. *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 1. March 1919. Pp. 1-34. 11 Charts.
2. "Preliminary Report on the Value of the Blood Tests in the Control of Contagious Abortion." C. P. FITCH, W. L. BOYD, and W. A. BILLINGS. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 681-702.
3. "The Present Status of Specific Treatment for Contagious Abortion." H. P. HOSKINS. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 727-737.

1. Seddon's article is mainly concerned with the value of the agglutination test in the diagnosis of contagious abortion in cattle. In the experience of the writer the agglutination test "has been found thoroughly reliable, so that when properly conducted a positive result can be held to establish the fact of infection; and, conversely, failure to

obtain a positive result (we have every reason to believe) may be taken to indicate non-infection." Owing to the presence of natural or non-specific agglutinins in the blood serum of all animals, a positive reaction, with a suspension of *Bacillus abortus*, will probably be obtained in all healthy animals if the serum is used in sufficiently large quantities. But in infection with *Bacillus abortus* a set of specific agglutinins are produced in much greater concentration than the non-specific agglutinins in the serum of healthy animals, and hence a much smaller quantity of serum will contain sufficient to produce agglutination of the *Bacillus abortus*.

The author considers that an agglutination titre of 0·01 c.c. represents infection with *Bacillus abortus*. "Cows giving an agglutination with any quantity of serum not exceeding 0·01 c.c. are, therefore, said to give a positive reaction, whereas those which require a greater quantity of serum are considered to give a negative reaction."

"*Bacillus abortus* is able to establish itself, with the production of visible lesions, in the testicle of a young bull (three months old) after intravenous inoculation, and to persist in that animal for at least 182 days."

2. Fitch, Boyd, and Billings have been making observations on the blood tests for contagious abortion since 1912, and now issue a preliminary report on the results of their observations. Details are furnished of the result of agglutination tests carried out on 455 animals belonging to ten representative herds. In each case the authors have endeavoured to secure as accurate a breeding history as possible, taking into account not only the act of abortion, but also the occurrence of retention of the placenta and sterility as well. Their conclusions are stated in the following manner:—

"(1) The complement fixation test seems to have no advantage over the agglutination test in the diagnosis of contagious abortion. (2) The technique of the agglutination test is simpler than that of complement fixation, and the results of the agglutination test are not influenced by as many factors (conglutinin, etc.). (3) The results of the agglutination test show the relative amount of herd infection. The test cannot be relied on to pick out individual aborters. (4) The blood of calves may have the same agglutination titre as that of their dams. Many, however, react differently. (5) The agglutination test of animals from eight to ten months of age usually shows that agglutinating antibodies are not present in their blood. (6) Herd bulls often react positively to the agglutination test. (7) At present the results of the agglutination test cannot be utilised as a basis for control measures for abortion disease."

3. Hoskins has collected and examined available reports on the value of the specific treatment of contagious abortion, and summarises

them as follows:—"The consensus of opinion, as expressed by recognised authorities, is to the effect that vaccines and bacterins made from dead abortion bacilli are of no real value in the prevention, cure, or control of the disease. Such preparations are probably harmless in so far as any danger to the treated animals is concerned, but they may possess a potential danger by causing veterinarians to overlook other methods of handling the disease. . . . Experiments with vaccines consisting of living organisms are apparently more encouraging according to the work thus far reported. If a stable product can be prepared for use under actual conditions, and a safe method of distribution and administration devised, the product may prove to be of considerable value in the control of the disease. The use of anti-abortion serum is rather limited, owing to the nature of the disease. Theoretically its employment in certain conditions is perfectly rational, if the value of the cow or her progeny warrants the expense. Some clinical observations would suggest that the colon organism is more important in the common disease of the new-born calf than *B. abortus*, even though the latter is found in some cases of scours, pneumonia, arthritis, etc." The writer points out that the problem will be further complicated if the researches of Smith (see this *Review*, 1919, III, 170) are confirmed, and it is shown that there are two organisms, instead of one, responsible for the abortion so prevalent among cattle.

RINDERPEST.

1. "Sulla recettività alla vaccinazione antipestosa dei vitelli nati da mare immune verso la peste bovina. Esperimenti di siero-vaccinazione antipestosa (methods Kolle e Turner) in vitelli lattanto e dopo la slattamento." P. CROVERI. *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 65-71. *Il Nuovo Ercolani.* Vol. XXIV., No. 9. 15th May 1919. Pp. 101-107.
2. "Recrudescence de la peste bovine en Égypte." PIOT BEV. *Ann. Inst. Pasteur.* Vol. XXXIII., No. 3. March 1919. Pp. 197-207.
1. Croveri's experiments show that the milk of an actively immune mother, partaken of by the calf in the natural manner, confers a passive immunity on the calf. This immunity is maintained during the period of suckling, and remains for some time after weaning, but not longer than three months. During the period when the calf is immune (that is, during the time of suckling and for some time after), and during the period in which it may react to vaccination in the manner in which the adult reacts, there exists a time when the calf is receptive, but the

presence of a small amount of antibodies in the circulation renders the reaction very feeble, and limited to a fugaceous and slight elevation of temperature, or a slight lachrymation.

2. In a former note (*Ann. Inst. Pasteur*, 1916, xxx. 18) Piot Bey gave the results of the efforts made by the Egyptian Government to eradicate rinderpest by means of the simultaneous method of vaccination. Excellent results were being obtained when the events of 1914 put an end to the operation of the preventive campaign. Either because of recrudescence in badly affected areas, or because of the reintroduction of the disease by imported cattle, rinderpest reappeared in 1916 in several provinces of Upper Egypt and extended in 1917 to almost all the provinces of Lower Egypt.

The present paper gives details of observations made during and since August 1917, from which the author arrives at the following conclusions:—On the appearance of a focus of rinderpest, vaccination of all exposed animals by the simultaneous method is the most efficacious means of quickly arresting the spread of the disease by conferring an absolute immunity. If serum cannot be obtained, the individual isolation of infected animals gives temporary security. In all those countries in which rinderpest is rampant (Egypt, Soudan, Eritrea, Turkey, Russia, South Africa, India, the Philippines, etc.) it has been shown that there exists at the same time, in an endemic form, one or more diseases due to haematozoa, which appear to furnish a favourable soil for the evolution of rinderpest. Contrary to the conclusions of Koch in this connection, Piot Bey has found that vaccination with blood containing the parasites of bovine malaria is, in Egypt, absolutely without danger to both calves and adults. The susceptibility of calves to rinderpest is almost absolute in Egypt. Susceptibility diminishes as the animal becomes older, and, in the adult, varies in the neighbourhood of 50 per cent. Artificial immunity in both parents is apparently transmitted to the offspring, but immunity in one parent only appears to be without effect on the young. Immunity produced by vaccination lasts experimentally at least three years, and practically more than five years.

MEDICINE.

CEREBRO-SPINAL MENINGITIS OF THE HORSE IN THE ARGENTINE REPUBLIC.

1. "Sobre la enfermedad de los caballos." J. LIGNIÈRES. *Revista Zootecnica*. Vol. VI, No. 64. January 1919. Pp. 282-286.
2. "Sobre la enfermedad de los equinos." V. BOSSI. *Ibid.* No. 65. February 1919. Pp. 339-342.

3. "Contribución al estudio de la encéfalo meningitis epizootica del caballo." C. F. FLORES. *Revista Soc. Med. Vet.* Buenos Aires. Vol. IV., No. 2. February 1919. Pp. 35-42.

1. For some time past a serious disease with nervous symptoms has made its appearance annually in the Argentine Republic. In 1911, Quevedo concluded that the disease was due to a toxæmia resulting from alteration of the food in the intestine, and consequently wrote on it under the name of "la enfermedad de los rastrojos." In his general consideration of the disease, Lignières calls attention to a symptom that he thinks has not been sufficiently recognised. The first part of the respiratory tract—the mucous membrane of the nasal cavity—is intensely congested, of violaceous colour, and slightly covered with mucin. Generally, the pharynx is also affected in like manner. It is possible that the disease process may extend from the nose to the brain.

2. Bossi also reviews the various theories that have been held in regard to the etiology of the disease. The clinical syndrome may resemble that of equine typhoid or influenza, and the symptoms may be described as abdominal, thoracic, septicæmic, exanthematous, and nervous or cerebro-spinal. On the assumption that microbial toxins are developed in the gastro-intestinal tract, the nervous form of the disease has been called "balordone abdominale" (*balordo* = mad, frenzy). Bossi investigations have been made with an emulsion of softened areas of brain tissue derived from an animal suffering from the disease. The investigations are more fully described by Flores.

3. On post-mortem examination of a horse killed at an advanced stage of the disease, and in which the characteristic nervous symptoms had been marked, lesions were revealed that in some respects were comparable to those of septicæmia. The right hemisphere of the cerebrum was the site of very distinct foci of softening. Experiments were conducted with emulsions of brain from the softened areas, as well as with cerebro-spinal fluid and defibrinated blood, injected into the carotid. Some of the inoculated animals died in three or four days; but in others the disease ran a more chronic course, and did not end fatally until the twentieth or even the forty-fifth day.

The clinical symptoms in the inoculated animals were a mahogany discolouration of the conjunctiva, petechiae of the nasal mucous membrane, elevation of temperature, marked debility, rapid emaciation, loss of appetite, constipation, inco-ordination of movements, and oscillation of the hinder part of the body. There were also fibrillary muscular twitchings. The post-mortem lesions were similar to those of haemorrhagic septicæmia, with petechiae or larger extravasations, particularly

in the epicardium and endocardium. Experiments with the emulsion after filtration through a Chamberland F candle seemed to show that the disease was not due to a filterable virus.

OSTEOPOROSIS OF THE HORSE IN THE BELGIAN CONGO (Contribution à l'étude de l'ostéoporose au Congo belge). R. VAN SACEGHEM. *Bull. Soc. Path. Exot.* Vol. XII., No. 5. May 1919. Pp. 238-243.

The author contends that rickets, osteomalacia, and osteoporosis arise from identical causes. He suggests, therefore, that there should be a common generic name to indicate all three conditions, and thinks that the term "osseous cachexia" is suitable. At the same time, there is no reason why the different manifestations of the affection should not be indicated. Thus, osseous cachexia of the young is "rickets"; osseous cachexia of the adult is generally known as "osteomalacia"; while osseous cachexia of equines bears the distinctive name of "osteoporosis."

Osteoporosis of equines is very common in the Belgian Congo, and van Saceghem has sought for a cause in the amount of calcium content of soil and water. In those districts where the natural waters hold little or no calcium in solution (Lamba, Kitobola, Nyangwe) osteoporosis occurs; while it never appears in those regions where the natural waters contain calcium (Zambi). The author therefore concludes that osteoporosis in the Congo is due to lack of calcium.

FEEDING WITH SORGHUM AS A CAUSE OF COLIC (Alimentation au sorgho et coliques). CHAPUIS. *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 277-278.

When the horses of a certain mobile group were given 8½ lbs. of barley as their grain ration no cases of colic occurred; but with the substitution of sorghum for one-half of the barley there were numerous cases of colic. There was "gaseous indigestion" that often ended in rupture of the stomach. When the diet was altered to barley, hay, straw, and 1 lb. of sorghum there were only two cases of colic, and these were due to ordinary causes. On the diet being altered once more to half barley and half sorghum many fatal cases of colic were again encountered. Other instances are given, including an experimental feeding, to show that sorghum causes colic.

The conclusions arrived at are that sorghum ought only to be given at rare intervals and only in stations where good hygienic conditions obtain and where a sufficient allowance of hay and straw is available. It should not be used on the march where the above conditions do not exist.
(R. G. L.)

BOVINE HÆMOGLOBINURIC BILIARY FEVER IN ALGERIA.

1. "Fièvre bilieuse hémoglobinurique du bœuf d'Algérie, maladie distincte des piroplasmoses." EDM. and ET. SERGENT and A. LHÉRITIER. *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 108-120.
2. "Etude sur la pathogénie de la fièvre bilieuse hémoglobinurique des bovins en Algérie." P. VALLERY-RADOT and A. LHÉRITIER. *C. R. Soc. Biol.* Vol. LXXXII., No. 11. 12th April 1919. Pp. 389-391.

1. The Sergents and Lhéritier report the occurrence of a disease of cattle in Algeria for which they propose the specific name of hæmoglobinuric biliary fever. It is an important and well-known disease, commonly called simply "jaundice." The chief symptoms are jaundice, hæmoglobinuria, and fever. The disease rarely lasts longer than five or six days, and sometimes the animal succumbs in twenty-four hours. The mortality from the disease has been reported as ranging from 5 to 20 per cent. Seeing that the chief characteristics of the disease are those of a piroplasmosis, and that *Piroplasma bigeminum* is known to occur in Algeria, cases of "jaundice" have generally been regarded as piroplasmosis. There were, however, certain paradoxical features that struck the Sergents and Lhéritier at the outset of their research. They have made observations on natural cases and have conducted inoculation experiments, which have led to the conclusion that the disease is not a piroplasmosis. The examination of the blood was negative in the majority of cases, and in others small, annular, or bacilliform piroplasms alone were demonstrable. *Piroplasma parrum* (*Theileria parva*) played no part in the etiology of the cases studied. Koch's bodies, characteristic of East Coast fever, were always extremely rare in the lymph glands, and they were found with equal rarity in control animals. Inoculation experiments with the blood of diseased animals were negative. The authors also argue that the disease is not caused by *Piroplasma mutans*, because this organism was not more numerous in the blood of the sick than it was in control animals; the number of the organisms does not alter with the different phases of the disease, nor do they appear to be more numerous in animals inoculated with the blood or organs of diseased animals. Moreover, as already stated, the disease is not transmissible by inoculation.

2. Pasteur Vallery-Radot and Lhéritier have made a study of the pathogenesis of the above disease. Their observations on blood taken at various stages of the condition show that it has its origin in hæmolysis and a hæmoglobinæmia dependent upon extreme globular fragility. The hæmoglobinæmia is accompanied by hæmoglobinuria. The liberated

haemoglobin may be transformed secondarily into bile pigment, and thus may be explained the fact that sometimes the main symptom is haemoglobinuria, at other times jaundice. The intensity and rapidity of the haemolysis governs the symptomatology of the disease.

The jaundice is of a special type, comparable to the haemolytic jaundice described in human pathology. The urine contains only traces of bile pigment, or none at all; bile acids are absent; the faeces are not discoloured; the spleen is greatly enlarged. Microscopic examination of the liver has revealed only insignificant lesions, and, contrary to expectation, no iron pigment has been demonstrated.

PANCREATIC LITHIASIS OF CATTLE. C. P. FITCH, W. L. BOYD, and W. A.

BILLING. *Cornell Veterinarian.* Vol. IX., No. 2. April 1919.
Pp. 68-75. 1 Figure.

Calculi in the ducts of the pancreas are of relatively rare occurrence and little reference to the condition is made in the standard works on veterinary medicine. Cases, however, have been described as having occurred in cattle, and the present paper adds one more to the list. A pure-bred Guernsey cow suffered from impairment of the appetite and poverty in condition, with periodic short attacks of mild diarrhoea. The condition of the case fluctuated, with periods of apparent recovery followed by mild diarrhoea with nearly complete anorexia. Physical examination revealed nothing, and pancreatic disease was not suspected. An examination of the blood suggested a condition of anaemia. There was leucopenia; the number of lymphocytes was increased, while the polymorphonuclear leucocytes were fewer than normal. Emaciation was progressive and reached such a degree that it was decided to destroy the animal.

The most important feature of the post-mortem examination was the discovery of one large and several small calculi in the ducts of the pancreas. The large stone was approximately 1 cm. in diameter, and weighed 0·8 gramme. It occupied a portion of the main pancreatic duct near a large branch. The duct was greatly dilated at this point and it appeared as if the stone could move forward blocking the passage. The smaller stones ranged in size from a grain of wheat to that of fine sand. All were white, hard, irregularly spherical in form, and the smaller ones quite rough and stuck to the mucosa of the duct. They agreed somewhat closely in form and structure with those described by Scheuhert and Bergholz ("Zur Kenntniss der Pankreaskonkremente," *Zeitschr. f. physiol. Chem.*, 1907, iii. 338).

The authors briefly review the literature and give a number of references.

A BOVINE DISEASE OF INDETERMINATE NATURE (Aphticelle des bovidés).
BÉDEL. *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 325. January
1919. Pp. 12-17.

A disease differing but slightly from "foot-and-mouth" is described by Bédel as having occurred during the late spring among all the cattle coming into the Mézières area from evacuated regions. The symptoms noted were those of vesicles on the muzzle, lips, palate, and tongue (on the under surface only); very often they were found on the coronet, in the interdigital space, and sometimes on the vulva and teats. Those of the buccal mucous membrane were usually oval in shape, presenting an outer zone of inflammation, an intermediate yellowish zone, and a central spot, brown and circular. The latter on being removed left a depression the size of a pin's head. In bad cases desquamation of these central spots gave the mucous membrane a "riddled" appearance. The vesicles on the muzzle and lips were occasionally as large as a sixpenny piece. Occasionally they were almost touching, but never formed bullæ. Desquamation of the buccal vesicles was followed by pimpling of a dirty yellow colour.

The interdigital and coronary vesicles were more severe, and at times led to neurosis of the ligaments, or partial shedding of the skin of the heel. Symptoms resembling grease occurred when the pastern was affected. The animals were ill during some fifteen days, during which the appetite was fairly well preserved, and the temperature but little elevated—102°-103°. Age made no difference.

Material from the vesicles inoculated by puncture or scarification produced no result in calves or horses, but by inunction on the buccal mucous membrane it produced the disease in cattle. Several calves which had been affected were mixed up with cattle having genuine "foot-and-mouth"; some contracted it, which would tend to show that the two diseases are not one and the same, as foot-and-mouth usually gives immunity for some two years.

(R. S. L.)

AN UNDESCRIBED DISEASE OF THE DOG IN MOROCCO (Une affection non décrite du chien observée au Maroc). H. VELU. *Bull. Soc. Path. Exot.* Vol. XII., No. 3. March 1919. Pp. 132-134. 1 Plate (5 Figures).

In 1918 attention was drawn by Heckenroth (*Ann. Inst. Pasteur*, 1918, xxxii. 399-405; see this *Review*, 1918, II. 522) to a disease of dogs, unrecorded till then, characterised by nervous disturbance ending in death. A disease having many similarities has been observed in Morocco, where it partook of the nature of an enzootic. Dogs of all ages, breed, etc., were affected, and the canine population was almost

wiped out. Appearing about August, the disease reached its greatest intensity during September, and had almost died out by October. The symptoms recorded were very indefinite, and of a nervous, respiratory, and digestive character. Nervous symptoms were always dominant, and gave rise at times to suspicion of rabies. From the commencement paraplegia and lack of co-ordination were marked. The patients could only stand when the fore legs were spread well apart. In many cases the back was arched, and the weight of the body almost wholly supported on the fore legs. When the animal could walk, it did so in a hesitating, staggering manner. At times spasm of the muscles was seen, especially of those of the jaw, in which case the teeth continually chattered. Response to external stimuli was much interfered with, and paralysis was rapidly progressive.

Respiratory symptoms occurred after a few days, and were limited to the nasal region. A watery discharge appeared, and later became muco-purulent. A painful cough was accompanied by marked dyspnoea. Appetite was retained throughout, but the food was always vomited, and emaciation was rapid. The eyes were sunken and the facial expression anxious. It was but rarely that a case recovered, death usually supervening in eight to ten days in paralysis and coma.

To the naked eye post-mortem examination yielded negative results. So far all attempts have failed to transmit the disease by cohabitation or inoculation.

(R. S. L.)

METHODS.

A COMPARISON, WITH THE STANDARD PLATE METHOD, OF SOME RAPID METHODS FOR BACTERIOLOGIC ANALYSIS OF MILK. J. E. SIMMONS.
Journ. Inf. Dis. Vol. XXIV., No. 4. April 1919. Pp. 322-336.
5 Tables, 2 Charts.

In the examination of numerous samples of milk, it is desirable to use some method that is less expensive of time and equipment than the "standard plate method." The purpose of the investigation here reported was to compare some of the simpler and quicker methods with the standard plate method in order to determine their practical value. One hundred and thirty-six samples of milk, varying in bacterial content from 50-160,000,000 per c.c. were examined by five different methods: direct microscopic, standard plate, lactose plate, little plate of Frost (see this *Review*, 1917, I. 333), and reduction test. With milk containing less than 1,000,000 bacteria per c.c. all the methods used gave satisfactory results except the direct microscopic count. The lactose

plates on the whole gave results slightly higher than the plain agar plates, and these results seemed to follow the little plate counts more closely than those of the standard plates. The direct microscopic count was less reliable with samples having a low bacterial count than it was with poor samples of milk. With milk containing more than 1,000,000 bacteria per c.c. the lactose plates gave results considerably higher (50 per cent.) than the standard plates; the little plates were somewhat lower, while the direct microscopic count was highly satisfactory. The time of the reduction test varied from one-half hour to thirty hours. By it the bacterial content of highly-contaminated milk could be quickly and satisfactorily determined. The little plates furnished results in one-eighth to one-fifth of the time required by the other culture methods. The character of the bacterial flora was revealed in a striking manner by both the little plate and the direct microscopic count.

OBSTETRICS.

RETENTION OF THE PLACENTA IN THE MARE (Non-délivrance de la jument. Pression et traction combinées). BOUDEAUD. *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January-15th February 1919. Pp. 50-51.

Without venturing to assert that his method will remove all difficulties, Boudeaud describes a form of combined pressure and traction that he has found useful in the removal of retained placenta in the mare. In two of the three cases with which his note is concerned, he separated the placenta by passing the open right hand, with the fingers extended, between the wall of the uterus and the chorion, at the same time exercising traction on the free part of the placenta gathered up in the left hand. In the second of these cases he applied pressure to the placenta. The third case offered difficulties inasmuch as, because of resistance, in his progress from behind forwards he was not able to grip the placenta beyond a certain point. Then occurred to him the idea to replace the right hand, as a constricting agent, by a large wooden curtain-ring. This being done, the operation was very easy and very rapid.

"THE STERILITY PROBLEM" AS PRESENTED TO THE COUNTRY PRACTITIONER. W. E. FRINK. *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 103-109.

In cases of pyometra the author evacuates the contents of the uterus, using as large a catheter as possible, and flushes thoroughly with saline solution or a mild antiseptic. This he repeats at intervals

until the uterus is approximately normal in size. Sometimes, when mild antiseptic treatment is without avail, he fills the uterus with a two per cent. Lugol's solution. By manipulation by way of the rectum, the solution is evacuated through a catheter, since if allowed to escape into the vagina it causes considerable irritation. In these cases, the ovaries should be examined for lesions.

From the success attending cleansing of the genital tract, the author has been led to the practice, in herds where conditions warrant the method, of douching the vagina of each cow frequently from the time she gives birth to a calf to the time when she is again put to the bull. He pays particular attention to this for the first ten days after calving, and keeps it up as long and as frequently as is practicable. A mild antiseptic, usually saline or sodium carbonate solution, is employed; but if there is a discharge, a weak Dakin's solution is substituted. The solution is introduced as hot as the hand can bear, and a 24-oz. syringeful is employed for each cow.

According to Frink's experience, most ovarian cysts can be ruptured and corpora lutea expelled by the right hand in the rectum; but it is occasionally necessary to use both hands—one inserted into the vagina to rupture the cyst that has been pressed back by the other hand introduced into the rectum. Certain disagreeable sequelæ of the operation must not be forgotten. Occasionally the animal will evince considerable abdominal pain for an hour or more after treatment. Others show great depression and chill, probably from excessive haemorrhage; and the owner should always be warned of these complications and the possibility of fatal haemorrhage.

UTERINE SOUFFLE IN THE LARGE DOMESTIC ANIMALS (Sur le bruit de souffle utérin chez nos grandes femelles). BÉDEL., *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 50-52.

The classical treatises on veterinary obstetrics do not mention a uterine souffle (a sound made by the blood in the vessels of the gravid uterus), such as is present in the pregnant human female; but the author of this note, in 1902, noticed in a publication entitled *Revue d'obstétrique* that a soft souffle, rhythmic in character and synchronous with the heart-beats of the mother, had been observed on auscultation of the right flank of an anaemic primiparous cow during the eighth month of gestation. Since that time he has made a number of obstetrical auscultations, and has been able to detect the souffle in five cows and a mare during the later stages of gestation (from the seventh to the ninth month in the cows and towards the end of the eleventh month in the mare).

In the cow the uterine souffle was detected four times on auscultation in the region of the fold of the thigh. In a case of twin gestation, the sound was perceived in the lower third of the left flank. In the mare the souffle could be heard on auscultation of the abdomen between the middle line and the fold of the left thigh. The sound was always of good rhythm and isochronous with the heart-beat of the mother.

The sound is sometimes soft, sometimes harsher, and may be compared to the sound produced by whispering the words *fou* or *feu*, with the teeth slightly separated. In the case of twin gestation, the souffle was harsh and vibrating, and might be compared to the sound of the word *feu* whispered with closed teeth. The souffle is not constant, and generally disappears on any brusque movement of the foetus, though in two cases (one in the cow and one in the mare) it did not disappear when these movements were made.

From a diagnostic point of view, the souffle is of little importance, since it has only been detected in the later months of gestation, when other signs make diagnosis certain. Nevertheless, it appeared well to the author that attention should be called to the occurrence of the sound in order that it might be studied more fully.

PATHOLOGICAL ALTERATION OF THE FÖTUS AS A CAUSE OF DYSTOCIA
(Krankhafte Veränderungen der Leibesfrucht als Geburtshindernis). G. GIOVANOLI. *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 4. April 1919. Pp. 175-180.

This article is mainly concerned with an account of malformed and dropsical foetuses as affording difficulty in parturition. In the majority of cases the dropsical fluid is disposed in the subcutaneous tissues, and produces a shapeless, doughy conformation of the foetus. In some instances the fluid accumulates in the body cavities, or collects in the form of large cysts of the skin in various parts of the body. Rarely is the pathological foetus carried to full term: mostly abortion takes place. The author is evidently of the opinion that the condition depends in some manner on defect in the ovum or sperm, and he gives his experience of the same cow having given birth to three dropsical and three normal foetuses at different pregnancies. The obvious method of relieving the dystocia induced by these malformations is by allowing of the escape of the fluid by incisions of the skin or opening the body cavities of the foetus.

The writer adds an account of a case in a cow where rupture of the uterus was caused by stiffness of both shoulder and elbow joints of the foetus. There was alteration of the articular surfaces, and the joint capsules were thickened and surrounded by fibrous tissue. Movement in the joints was thus prevented. Both fore limbs were affected in the same way.

PARASITOLOGY

(Including Entomology and Protozoology).

INTESTINAL PARASITIC WORMS OF THE HORSE.

1. "The Anthelmintic Treatment of Equine Intestinal Strongylidosis." M. C. HALL, R. H. WILSON, and M. WIGDOR. *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 1. October 1918. Pp. 47-55. *Journ. Comp. Path. and Therap.* Vol. XXXI., No. 4. December 1918. Pp. 272-278.
 2. "Some Notes on the Treatment of Equine Ascariasis and Oxyuriasis." M. C. HALL, R. H. WILSON, and M. WIGDOR. *Ibid.* Pp. 56-57.
 3. "Le marasme des chevaux de troupe." URBAIN. *Rev. Gén. Méd. Vét.* Vol. XXVII., No. 318. June 1918. Pp. 240-246.
 4. "Troubles déterminés par les oxyures du cheval." BÉDEL. *Rec. Méd. Vét.* Vol. XCIV., No. 22. 30th November 1918. *Bull. Soc. Centr. Méd. Vét.* 7th November 1918. Pp. 452-458.
 5. "Notes cliniques sur l'oxyurose des équidés." C. DONNAT. *Ibid.* Pp. 458-464.
 6. "Note sur l'oxyurose du cheval." BÉDEL. *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 64-69.
 7. "The *Strongylidae* Infesting the Horse." W. A. HAGAN. *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 169-179. 1 Plate (7 Figures).
 8. "Accion traumática del *Strongylus equinus*." S. E. PARODI and V. WIDAKOVICH. *Revista Zootecnica.* Vol. VI., No. 64. January 1919. Pp. 277-282. 3 Plates (9 Figures).
1. Railliet (*Rec. Méd. Vét.*, 1915, xci. 490-513) has stated that it is difficult to expel parasites from the large intestine by oral medication. This is the prevailing view among parasitologists and members of the veterinary profession, and it is decidedly the general view regarding expulsion of strongyles from the horse. But, contrary to what has been supposed, Hall, Wilson, and Wigdor found that the removal of strongyles from the large intestine of the horse presented no great difficulty. They explain the high degree of efficacy of anthelmintics in this connection by assuming that it is due to the increase in the time factor, that is, the length of time during which the parasites are exposed to the anthelmintic. "Anthelmintic efficacy is a product of certain factors—the potency of the drug, the amount of the drug, the contact with the worms, and the period of contact with the worms. In a general way, an increase in any of these factors increases their product, which is the anthelmintic efficacy. Food and drugs pass

rather rapidly from the stomach and through the small intestine of the horse, but they lie for comparatively long periods in the cæcum and colon."

In the observations here recorded, daily collection and identification was made of the worms contained in the manure, and, on post-mortem examination, the contents of the large intestine were examined and the worms therein collected, counted, and identified. The efficacy of iron sulphate, tartar emetic, turpentine, and oil of chenopodium was tested. "The remedy of choice is oil of chenopodium, which displays an efficacy of 95 to 100 per cent. when given to horses fasted thirty-six hours and given in doses of 16 to 18 mils. (16 to 18 c.c.) in one dose or in divided doses, accompanied by a quart or a litre of linseed oil or followed one or two hours later by this amount of linseed oil. The small worms, *Cylicostomum*, are more readily removed than the large, red palisade worms, *Strongylus*, probably due to the fact that *Strongylus* attaches to the mucosa and *Cylicostomum* does not. Turpentine appears to be the second choice of remedies tested. In the doses used, iron sulphate (2 drachms in a mash daily for seven days) and tartar emetic (2 drachms in a mash daily for five days) gave very poor results and promised little of value in the treatment of strongylidosis."

2. Seven of the ten horses used in the foregoing investigation were infested with *Oxyuris equi*, and eight with *Ascaris equorum*. Treatment with 16 to 18 mils. of oil of chenopodium after fasting more than twenty-four hours, the administration of 2-oz. doses of turpentine, and the daily administration of 2 drachms of tartar emetic in a mash for five days, were all entirely successful in the case of *Oxyuris*. With *Ascaris*, however, the results were not encouraging. The experiments confirm the idea that equine oxyurosis is readily amenable to anthelmintic treatment, and that equine ascariasis is not readily amenable.

3. Urbain has been struck with the increasing number of horses in the Belgian Army that have to be evacuated on account of "marasmus." In post-mortem examinations of these cases he has found a cylicostome and *Strongylus equinus* in the cæcum and colon, to the presence of which he attributes the abnormal condition of the animals. There are four characteristic symptoms:—(1) The appearance of general good health; (2) a slow and progressive emaciation; (3) exaggeration of the appetite (bulimia) and possibly pica; (4) absence of an elevation of temperature or other febrile symptoms. The disease is very slow, and it is only after months (six or seven) that there are signs of malnutrition. The animal becomes progressively feeble, is ultimately unable to rise, and dies from infection of decubitus sores.

The lesions are those of a verminous cachexia. The muscles are

wasted; the connective tissues are infiltrated with a serosity; and there is effusion into the peritoneal, pleural, and pericardial cavities. Numerous larvæ and adults of the cylicostome and the sclerostome are found in the cæcum and colon. The wall of the intestine contains cysts produced by parasitic embryos. There are often parasitic nodules in the liver and lung. The nodules are white or yellowish, spheroidal, calcified, of a size ranging from that of a millet seed to that of a bean, and easily enucleated. They are scattered under the serous covering or in the depth of the organs, and consist of a central caseocalcareous mass surrounded with a fibrous envelope. Microscopic examination of them reveals the larva of the nematode, always altered and often difficult to identify.

Curative treatment consists of the administration of thymol, santonin, calomel, essence of terebinth, creolin, or picric acid; or these substances may be injected directly into the cæcum or colon. The destruction of the encysted larvæ may be attempted by the intravenous injection of atoxyl or cacodylate of sodium. Wholesome food and special hygienic care are necessary, with the administration of such tonics as arrhenal, atoxyl, cacodylate of sodium, etc.

Preventive measures consist in avoiding the purchase of animals or forage from infected districts. The dung of infected animals should not be allowed to accumulate in the neighbourhood of stables nor spread upon pastures, but should be disposed of for use on cultivated land. Manure should be sprinkled with lime water, and infected pasture should be treated with sulphur.

4. Bédel does not agree with Neumann (*Traité des maladies parasites*) when he says that the effects of the presence of *Oxyuris curvula* in the horse are "analogous to those produced by *Oxyuris vermicularis* in man; that is, heat, pruritus, and tenesmus; the margin of the anus is red and swollen, and there is frequent swishing of the tail. But, after all, the worm appears to be fairly inoffensive." Bédel holds that the parasite is not always as inoffensive as some would lead us to think, and it may, like ascarides, produce emaciation, provoke dull or violent colic, and even be the cause of enteritis. A number of cases are briefly described in support of this opinion.

5. Donnat is also of the opinion that oxyurosis may be serious or even fatal. The anal pruritus, rubbing of the tail, etc., described by Railliet (this *Review*, 1918, II. 139-157), are the earlier symptoms. After a time the animal becomes gradually thinner, though preserving an excellent appetite. This is not prevented even though the food be improved, but persists and progresses until the animal becomes a staggering skeleton. The limbs are stiff and the back is continually arched. The eye is dull, but there is neither lachrymation nor oedema

of the lids. The conjunctiva, in common with all mucous membranes, grows paler and paler, revealing a progressive anaemia, and petechiae may make their appearance. Sometimes dull colic is present, but it is of short duration. The appetite persists up to the last ten days of the illness, when the horse, becoming progressively thinner, moves with difficulty and is drowsy. Sensibility remains, but the reactions are feeble. The animal lies down and dies rapidly, but without pain.

Diagnosis of the disease in horses in Africa is rendered difficult from the fact that trypanosomiasis induces the same symptoms. The author, however, has found that in trypanosomiasis the red corpuscles of fresh drawn blood rapidly group together; that is, there is an auto-agglutination. This is absent in oxyurosis.

In treatment, Donnat has used small and repeated doses of thymol (7 to 8 grammes for three or four days), larger doses of thymol (20 grammes), tartar emetic (15 grammes), and soapy enemas. He has always obtained the expulsion of the long-tailed oxyure from the posterior part of the intestine, but strongyles in the colon have not been affected.

6. According to Bédé, oxyurosis of the horse is of common occurrence in certain districts of Calvados (Normandy). It is encountered in Dozulé and Cambremer, as well as in the valley of the river Dives. The humid climate and the clayey soil apparently lend themselves to the development of the parasite. The long-tailed oxyure is much rarer. The parasites are found at all seasons, but are most abundantly expelled during the period from December to May. They are more numerous in wet than in dry years, and are more frequent, in the region of Dozulé, than ascarides or sclerostomes. In ten cases of helminthiasis one will find oxyures alone in about five instances, ascarides alone in about two cases, sclerostomes alone once, and a mixture of parasites once. The frequency of occurrence of oxyures appears to increase in certain years. One owner states that his animals were free for ten years, and then for four or five years some parasites were expelled each year.

Irritation of the large intestine leads to enteritis and anaemia; and, though the condition generally disappears with the expulsion of the parasites as the result of appropriate treatment, death may be caused in the case of pregnant mares and young foals. The author treats the helminthiasis by giving turpentine and arsenic. Sometimes he adds calomel to the arsenic; and sometimes he uses enemata of 0·5 per cent. solution of cresyl.

7. Hagan gives the following table to show the relationship of the genera and species of the Strongylidæ:—

Family.	Sub-family.	Genus.	Species.
Strongyliidæ	1. Metastrongylinæ . .	{ None parasitic in the horse.	
	2. Trichostrongylinæ . .	{ None parasitic in the horse.	
		{ <i>(Esophagostomum</i> . . <i>Chabertia</i> : : <i>Ankylostoma</i> : : <i>Uncinaria</i> : : <i>Bunostomum</i> : : <i>Syngamus</i> : : <i>Stephanurus</i> : :	{ None parasitic in the horse.
		<i>Strongylus</i> . .	{ <i>S. equinus</i> . <i>S. vulgaris</i> . <i>S. edentatus</i> .
			{ <i>C. labiatum</i> . <i>C. tetraranthum</i> . <i>C. labratum</i> . <i>C. alveatum</i> . <i>C. porcatum</i> . <i>C. incoronatum</i> . <i>C. cutinatum</i> . <i>C. elongatum</i> . <i>C. nassatum</i> . <i>C. calicatum</i> . <i>C. auriculatum</i> . <i>C. radiatum</i> . <i>C. coronatum</i> . <i>C. mettami</i> . <i>C. euproctus</i> . <i>C. insigne</i> . <i>C. goldi</i> .
	3. Strongylinæ . .	<i>Cylicostomum</i> . .	<i>(Esophagodontus</i> . . <i>O. robustus</i> . <i>Gyalocephalus</i> . . <i>G. capitatus</i> .
			<i>Triodontophorus</i> . . { <i>T. serratus</i> . <i>T. minor</i> . <i>T. tenuicollis</i> . <i>T. brevicauda</i> . <i>T. intermedius</i> .

8. Parodi and Widakovich have made an extensive study of the buccal capsule of *Strongylus equinus* and the lesions produced by the parasite in the cæcum and colon of the horse. In the greater number of cases examined they have found the parasites firmly attached to the mucous membrane of the intestine, and generally the strongyles are adherent a little distance from each other. Occasionally, but rarely, they have encountered true colonies of parasites grouped and adherent to the intestine close to each other. The lesions produced are described as being of four kinds: (1) small wounds or punctures, (2) oedematous

swellings, (3) small or large ulcerations, and (4) mucous or submucous nodules. The small wounds are caused by the fixation of the parasite in such a manner that the mucous membrane of the intestine is sucked into the buccal capsule. When the strongyle is detached, the mucous membrane presents a small papular elevation. Microscopically, there is profound alteration of the mucous membrane involved. There is a complete disappearance of the tubular glands, their place being taken by a mass that presents a homogeneous appearance, due on the one hand to necrosis of the tissues, and on the other to an intense infiltration of eosinophile cells. In the interior of the necrotic magma the eosinophiles lose their outlines, blend with each other, and give the characteristic appearance to the necrotic lesions. More pronounced lesions are produced when many parasites are present. These consist of extensive œdema that infiltrates the tissues and causes alterations in their cells. The arterioles are dilated and there is intense infiltration of eosinophile cells. In some of the cases observed by the authors, the cedematous swelling of the wall of the cæcum has been of large extent. In one instance it was 1·20 metres in length.

Small or large ulcers are produced by the elimination of the necrosed part of the mucous membrane. According to Weinberg (*Ann. Inst. Pasteur*, 1907), healing of these ulcers depends upon the virulence or otherwise of organisms introduced by the strongyles. If the micro-organisms are innocuous, the ulcers heal rapidly and leave no scars. Small ulcers may be several millimetres in diameter. Other ulcers are rounded, with depressed centres, and covered with blood and a greyish magma. Microscopic examination of the ulcers shows that the mucous membrane has been completely destroyed, and that the deeper part of the submucous tissue is the site of a leucocytic infiltration and contains many micro-organisms.

The mucous and submucous nodules contain larvæ of the parasites. Some of the nodules are small, about $250\ \mu$ in diameter, and are situated immediately beneath the epithelium of the mucous membrane. The larger nodules are submucous, and may attain the size of a hazel-nut. They protrude into the intestine and may present a small orifice by which the larva has escaped.

PARASITIC MANGE.

1. "Note relative au traitement de la gale des équidés." A. DELMER.
Rec. Méd. Vét. Vol. XCV., No. 9. 15th May 1919. Pp. 262-266.
2. "Contribution à l'étude du diagnostic différentiel et du traitement de la gale des solipèdes aux armées." SOULET. *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 325. January 1919. Pp. 1-12.

3. "Gale du dromadaire (Première note)." EDM. SERGENT and A. LHÉRITIER. *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 94-99. 5 Figures.

1. Delmer has forsaken all the usual dressings for mange in favour of the following formula:—

Ground-nut oil	.	.	.	100	grammes.
Potash soft soap	.	.	.	100	"
Water	.	.	.	180	"
Pure cresyl, of good quality	.	.	.	20	"

The soft soap is stirred into the oil until a homogeneous mixture is formed. Then the water (at a temperature of 50° or 60° or even higher), in which the cresyl has been dissolved, is added little by little with constant stirring. There is thus produced a perfect emulsion of semi-fluid consistence that easily adheres to the skin. It is claimed that the advantages of the preparation are: simple and easy method of preparation, moderate price, a stable emulsion that is non-toxic and irritates neither the skin of the animal nor the hands of the dresser, a very effective acaricide that has the power of removing epidermic accretions and pathological products, the soothing oil corrects the vesication that might be induced by the potash soap.

On the evening before the dressing is applied, the horse is clipped completely and washed with soap and water applied with a brush of moderate hardness. If epidermic crusts are difficult to remove, the soap may be allowed to remain on the skin for six, eight, ten, or twelve hours before being washed off. On the following day the dressing is applied at a temperature of about 40°, with prolonged and vigorous rubbing. The animal thus dressed is placed in the stable and protected from cold. Three or four days later the whole body is washed and re-dressed. A third washing and dressing is performed three or four days after the second, and it may be necessary to resort to a fourth application. The author has not found it necessary to make more than four dressings, even when the mange is chronic and generalised. Only once has he observed symptoms that might possibly be attributed to the effects of absorption of cresyl, but even in this case he is not sure that the disturbance may not have been due to the application of the dressing to too extensive a surface of the body.

2. In spite of the large volume of literature that has appeared during the last few years, Soulet thinks there is still the possibility that his remarks may be of use, more especially to the young practitioner. In the treatment of parasitic mange, Soulet is an advocate of the practice of preliminary clipping, partial or complete, in accordance with the

extent of the lesions. The practice has more advantages than disadvantages, and the author is of opinion that it would be well to clip systematically all army horses sometime between 15th October and 15th November, and not in the springtime. If the horses are in good condition, no objections can be advanced against clipping; if the horses are not in good condition, improved rations can always be resorted to as a preventive of untoward effects. The betterment of the cutaneous function attendant upon clipping reacts favourably on the general health of the horse.

Soulet objects to the use of black (potash) soap in the washing resorted to before the application of an active dressing in the treatment of mange. The impurities of the soap may induce dermatitis. The use of cresyl solutions is also to be avoided. If the solution is weak, it has no effect; if it is strong, it produces irritation of the skin. The author uses a warm 4 per cent. solution of sodium carbonate. This does not induce irritation, and it may be used several times if necessary.

Soulet has recently experimented with a modification of Helmerich's dressing and has found that good results were obtained by the use of the following formula:—

Sublimed sulphur	.	.	.	.	.	120
Carbonate of sodium	.	.	.	.	.	60
Water	.	.	.	.	.	60
Pea-nut oil	.	.	.	.	.	60
Lard	.	.	.	.	.	350
Oil of cade	.	.	.	.	.	60

This is applied, with a two-day interval, to each half of the body. On the day following the application the dressing that has collected at the end of the hairs is lightly rubbed in with the palm of the hand. After six days the animal is washed with sodium carbonate solution (4 per cent.) and the dressing is renewed if necessary. The internal administration of 10 to 12 grammes of sulphur per diem for eight to ten days appears to assist in the restoration of cutaneous function.

3. Sergent and Lhéritier give a detailed description of *Sarcopetes scabiei*, var. *cameli*, with the morphological characters of which, so far as they know, no author has as yet dealt. They point out that parasitic mange in the dromedary is a very serious disease, which leads to marasmus and death if no treatment is applied. In a herd of dromedaries that reached them in the springtime, every animal presented traces of mange and all were in a poor condition. The lesions remained discrete for several weeks and then suddenly invaded the whole body. This generalisation led to the death of the animals in from two to three months. The authors have essayed to treat the disease by washing with soap and water and the application of a solution of cresyl. All animals

so treated died, and post-mortem examination revealed pulmonary congestion. As Sergent and Lhéritier have already shown (*C. R. Soc. Biol.*, 1919, lxxxii. 172-175; this *Review*, 1919, III. 251) the dromedary is extremely sensitive to the effects of moisture applied to the surface of the body, which rapidly lowers the rectal temperature. The best treatment so far devised consists of the application of a tar prepared from *Juniperus phrenicea* and *Thuya articulata*. This does well provided it is applied early and thoroughly, and is repeated. (On the treatment of mange in the dromedary and camel, see the abstract of an article by Curasson in this *Review*, 1919, III. 193). Mange of the dromedary is very readily transmitted to man, in whom it may cause very serious consequences.

PARASITIC DISEASES. S. HADWEN. *Journ. Amer. Vet. Med. Assoc.*
Vol. LIV., No. 6. February 1919. Pp. 639-642. 3 Figures.

For a number of years there have been outbreaks of fistulous withers and poll evil among the unbroken horses on the ranges on the western slopes of the Rocky Mountains in Canada. The outbreaks frequently appear early in the season, and hitherto no predisposing cause has been discovered. Hadwen is now convinced that ticks play an important rôle in the production of fistulous withers. *Dermacentor albipictus* is probably the chief offender, but *D. venustus* is also a possible factor. "*D. albipictus* is commonly called the 'winter tick'; and in some regions of British Columbia, especially where poll evil and fistulous withers are common, horses are heavily infested with these ticks. The favourite seat for attachment is along the whole length of the mane, from the poll to the withers. If an animal is examined when a heavy infestation is present, it will be noted that at each point of attachment there is a necrotic spot if the tick has been attached for a few days. . . . It is easy to see that these necrotic spots should be a favourable point of entrance for bacteria."

Preventive measures should be easy, and the application of either of the following dressings (from Steele's *Diseases of the Sheep*), which used to be applied years ago to sheep in Scotland, is suggested:— Butter and lard, 18 lbs. of each; resin, 12 lbs.; Gallipoli oil, 1 gallon. Train or seal oil, 4 gallons; tar, $\frac{1}{2}$ gallon; oil of turpentine, 1 lb.

ONCHOCERCIASIS AND FISTULOUS WITHERS (L'oncocercose cervicale et le mal de garrot). A. RAILLIET. *Rec. Méd. Vét.* Vol. XCV., No. 6.
30th March 1919. *Bull. Soc. Centr. Méd. Vét.* 6th March 1919.
Pp. 111-116.

Hamoir sent to Railliet a collection of *Onchocerca cervicalis* Railliet and Henry, which he said had been derived from fistula of the withers

for which he was treating four horses. In 1891 Railliet (*Rec. Méd. Vét.*, 1891, xlv.; *Bull. Soc. Centr. Méd. Vét.*, 85-89) described for the first time in France the occurrence of the parasite in the ligamentum nuchæ of a horse. But Bowett, of Bridgwater ("Existence of Filaria in a Sinuous Ulcer of the Withers of a Mare," *Veterinarian*, 1861, xxxiv. 515), had apparently encountered the parasite in fistulous withers thirty years earlier.

The present paper is of interest in connection with a recent article by Robson ("Filariasis of the Withers in the Horse," *Vet. Record*, 1918, xxx. 348-351; see this *Review*, 1918, II. 180), in which parasites are described which Railliet thinks are almost certainly *Onchocerca cervicalis*. The notes supplied by Hamoir to Railliet agree closely with the descriptions given by Robson, and Railliet expresses the opinion that the attention of the veterinary surgeon should be directed to the parasite as an etiological factor in the production of a serious surgical condition. It is possible that the treatment of fistulous withers might be modified in accordance with the parasitic nature of certain cases, the proportion of which has yet to be determined, but is apparently not entirely negligible. It has been shown that the injection of arsenobenzol is capable of destroying filaria in man (Morlot and Zuber, "Néosalvarsan et *Filaria loa*," *C. R. Soc. Biol.*, 1914, lxxvii. 475-476; Janselme, "Note sur un cas de ver de Guinée radicalement guéri par le novarseno-benzol en injections intraveineuses," *Bull. Acad. Méd.*, 1919, lxxxii. 156-158). Certainly arsenical treatment appears to be indicated in cases of parasitic fistulous withers.

THE HOG LOUSE: *HEMATOPINUS suis* (LINNEUS) LEACH. H. R. WATTS. *Bull. No. 120.* Agric. Exp. Station, Univ. Tennessee. July 1918. P. 16. 7 Figures.

This Bulletin is a preliminary report and a popular account of investigations into the life-history and habits of *Hematopinus suis* carried out at the Experiment Station at Knoxville, Tennessee.

The eggs of the louse are glued to the base of the hairs, mainly on the lower half of the body. The parasite becomes mature, and the female begins to lay eggs in from eleven to thirteen days after hatching. Three or four eggs are laid a day, and only one egg is laid at a time. The eggs are only laid on pigs, and hatch in from thirteen to twenty days, the majority hatching on the fifteenth, sixteenth, and seventeenth days.

Normally the louse lives about thirty days, but many are injured, killed, and lost from the host before that time. A few have been found to live for more than forty days, but this is exceptional. The life-cycle normally occupies twenty-nine to forty days, but varies from twenty-

four to sixty-three days. The number of generations is usually from nine to twelve a year, but may vary from six to fifteen.

Any oil or oily mixture will kill both lice and eggs, and the application of a thin oil is the best remedy. Thick and heavy greases or pastes should not be used, as they do not spread sufficiently readily, and are not economical. Medicated oils, disinfectants, and various proprietary remedies have no advantage over common oils, but may be effective if they contain a considerable amount of oil and no injurious substances. Poisonous preparations should not be used on account of the danger attending their employment.

[See also treatment suggested by Ritchie, *Journ. Jamaica Agric. Soc.*, 1917, xxi. 91-92 (this *Review*, 1917, I. 460).]

SOME NOTES ON THE USE OF TARTAR EMETIC IN THE TREATMENT OF
DOMESTIC ANIMALS Affected WITH AFRICAN TRYpanosomiasis.
H. E. HORNBY. *Vet. Journ.* Vol. LXXV., No. 3. March 1919.
Pp. 89-103.

"On account of its solubility, low toxicity, and high trypanocidal action, tartar emetic is probably the most valuable drug available for use on a large scale in the treatment of domestic animals affected with trypanosomiasis. Its cheapness is also a point in its favour. It can be administered intramuscularly or intravenously, but the latter method is the better. One gramme every third day is the maximum that can be administered over a long period to even the largest animals, but the same amount every fifth day is well tolerated by adult bovines and equines. Administered *secundum artem* it is capable of effecting cures in domestic animals infected with certain strains of *Trypanosoma vivax* and *T. congolense*. On the other hand, one frequently encounters resistant strains of the same parasites. Nevertheless, were it possible to give the patient a course of injections extending over a long period, I believe that most cases of disease due to these two species of trypanosomes could be cured. Sometimes a single injection will bring about this result. Tartar emetic shares with all other known drugs the property of being useless in the curative treatment of *T. brucei* infection of equines. Its sole value in connection with that form of trypanosomiasis is palliative when given regularly to animals in 'fly.'"

PRACTICAL METHODS OF PROPHYLAXIS AGAINST WORM INFESTATIONS.
B. H. RANSOM. *Journ. Amer. Vet. Med. Assoc.* Vol. LXXV.,
No. 1. April 1919. Pp. 46-56.

The author gives certain rules or principles that have a more or less general application in the prevention of infestation with parasitic worms.

Wet land, being very favourable to infestation, should be drained or excluded from pasture. Parasitic infestation is favoured by close-grazing, over-stocking, and the long-continued use of the same pasture. Stock should be changed to fresh pasture as frequently as possible. Generally speaking, the parasite of ruminants, horses, and pigs are not inter-transmissible. These three classes of animal, therefore, may be pastured in rotation on the same ground without danger (with some exceptions) of the transmission of parasites from one class to the other. Stock should be excluded from places where manure is stored, and these places should not be drained into pastures or paddocks or into water supplies. The exact importance of more or less fermented manure as a source of parasitic infection when spread on ground is not yet clearly known.

Animals infested with parasitic worms will often show improvement in condition if they are taken from pasture and placed in dry, clean, and properly-drained yards or stables from which the manure is frequently removed. Well-fed animals are less likely to suffer from the effects of parasitic worms than those supplied with insufficient food. A clean water supply, free from faecal contamination, is important. Dogs should be kept free from tapeworms, and should not be allowed to eat dead animals; nor should they be fed with raw mutton or uncooked offal of any kind.

PATHOLOGY AND BACTERIOLOGY.

OCCURRENCE OF COCCIDIOIDAL GRANULOMA (OIDIOMYCOSIS) IN CATTLE.

L. T. GILTNER. *Journ. Agric. Res.* Vol. XIV., No. 12. 16th September 1918. Pp. 533-543. 2 Plates (6 Figures).

Though coccidioidal granuloma has been several times described as occurring in man, it does not appear to be a widely-distributed affection, nearly all the cases reported being in patients living in the San Joaquin Valley, California. The writer of the present article encountered the infection in bovine bronchial and mediastinal lymph glands forwarded to him from an abattoir in San Diego, California. The parasite observed in pus from these glands appears to be identical with that found in the lesions of human cases, and called *Coccidioides immitis* by Rixford and Gilchrist ("Two Cases of Protozoan (Coccidioidal) Infection of the Skin and Other Organs," *Johns Hopkins Hosp. Reports*, 1896, i. 209-267). The organism was present in considerable numbers in the purulent centre of the

lesion and in the surrounding granulation tissue. "It appears as a spherical body varying from 3μ to 35μ in diameter and having a doubly-contoured and highly-refractive covering, which is from 1μ to 5μ thick. In some parasites the protoplasm appears very finely granular, while in others it is more coarsely granular and sometimes vacuolated. Large spheres containing many smaller ones of a diameter about 3μ to 5μ are observed, and occasionally one sees these large bodies in a ruptured state releasing the enclosed spores. The broken empty shells may be seen being invaded by leucocytes. Neither mycelia nor gemmation forms are ever found in the lesions, although the latter type is often simulated when two bodies lie in close contact with each other."

Little is known of the disease in cattle, as it results from natural infection, but it is very likely that the source of infection and mode of transmission is the same as in man. Judging from the results of experimental inoculation, however, cattle are not nearly so susceptible as man. So far as present knowledge goes, the lesions observed in cattle appear to be confined mainly to the bronchial and mediastinal lymph glands. Large areas of suppuration or several smaller purulent foci are usually surrounded by considerable granulation tissue. When an affected gland is incised, one may squeeze out a thick, yellowish, and tenacious pus, which at once suggests actinomycosis. "In fact, the similarity of the lesions produced in the lymph glands by *Coccidioides immitis* and actinomyces is so striking that the one affection may be easily mistaken for the other upon gross inspection alone. However, microscopic examination of fresh smears of pus at once establishes a diagnosis; in the one case spheres in various degrees of development are present in quite large numbers, and in the other the colonies of the ray fungus are detected."

Successful inoculations were made with guinea-pigs, rabbits, dogs, cattle, sheep, and swine, in this order of susceptibility. Rapid generalisation of the disease follows intravenous inoculation, and subcutaneous inoculation proved fairly rapidly fatal in the guinea-pig and dog. The experimental lesions most commonly found were miliary or submiliary nodules or abscesses in practically all the internal organs. Structurally the nodules are almost identical with those produced by tubercle bacilli.

Cattle affected with the disease showed no response to subcutaneous allergic tests. Neither specific complement-fixing bodies nor agglutinins were detectable in the serum of affected animals.

A STUDY OF THE ENDOCARDIAL LESIONS DEVELOPING DURING PNEUMOCOCCUS INFECTION IN HORSES. A. B. WADSWORTH. *Journ. Med. Res.* Vol. XXXIX., No. 3. January 1919. Pp. 279-292. 6 Plates (15 Figures).

During the process of immunising horses by the intravenous injection of living virulent pneumococcus cultures, local infectious processes develop in joints and in the tissues of organs, especially those of the heart and its valves. These lesions are intimately associated with injury to blood-vessels induced by the pneumococcus poisons, and are thus infectious processes in which the bacterial development may be evanescent and quickly followed by resolution or by reparative processes with scar tissue, or the bacterial development may persist and incite varying degrees of inflammatory reaction and necrosis before the bacteria are destroyed and reparative processes take place. "All stages of these lesions were found in the heart valves: petechial and larger haemorrhages with and without inflammatory reaction, and larger and smaller areas of necrosis in which pneumococci were present in large or small numbers or absent altogether, all in various stages of development, resolution, and repair. These lesions correspond to those of acute and chronic endocarditis in man. The anatomical changes of the ulcerative or vegetative and sclerosed lesions in man are all found in these lesions of the horse."

The endocardial lesions arise from injury produced by the bacteria and their poisons that are carried to the endocardial tissue by the coronary arteries, and are not the result of the direct action of bacteria and their products passing through the cavities of the heart.

THE MECHANISM OF PIGMENTATION IN MELANOTIC SARCOMA (Le mécanisme de la pigmentation dans le sarcome mélanique). G. PETIT. *Rec. Méd. Vét.* Vol. XCV., No. 5. 15th March 1919. Pp. 121-130. 6 Figures.

The author has made a study of a case of melanotic sarcoma of the eye of a dog, a case of melanotic metastases of the liver of a horse, and a case of a horse in which secondary melanotic foci were associated with a primary non-pigmented spindle-celled sarcoma of the skin.

It is stated that a melanotic sarcoma may be primarily, though exceptionally, an ordinary round- or spindle-celled sarcoma: there is nothing to differentiate it from the usual type of tumour.

The facts elicited from the cases examined by Petit appear to lead to the conclusion that the pigmentation of melanotic sarcomatous tumours, whatever may be the initial site, is connected with a protoplasmic secretion rather than with any other process.

PHARMACOLOGY AND THERAPEUTICS.

THE SUBCUTANEOUS INJECTION OF TALLIANINE IN CASES OF RESPIRATORY DISEASE. J. F. D. TUTT. *Vet. Journ.* Vol. LXXV., No. 5. May 1919. Pp. 180-184.

Tallianine (terpene ozone) is prepared by the action of ozone on terpene, the process being stopped when the resulting product is capable of evolving four times its own volume of ozone. The preparation is a colourless liquid, and should bubble when exposed to the air. If it does not, little or no benefit will be obtained from its use in respiratory cases. The dose for the horse is 10 to 20 c.c. It can also be used for smaller animals, such as dogs, in doses of 3 to 5 c.c. The drug may be administered intravenously, intratracheally, or subcutaneously; but the author always gives it subcutaneously, by which route he considers it is just as effective as by the jugular vein or the trachea.

Tutt's conclusions are that "tallianine, if used early and repeated at intervals, has a marked effect in cases of respiratory disease, and is the best remedy so far discovered for subcutaneous medication. Its action is rapid—an alteration in respiration has been observed within ten minutes of inoculation, and usually within thirty minutes in every case. It can be used when the administration of medicines *per os* is impracticable." Good results have been obtained from its use in the respiratory form of distemper in dogs.

PASTES FOR THE TREATMENT OF DERMATOSES ("Pâtes" et "pommades" dans le traitement des dermatoses). MARCENAC. *Rec. Méd. Vét.* Vol. XCIV., No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 19th December 1918. Pp. 508-511.

The author discusses the advantages of pastes over ointments in the treatment of skin diseases, and gives the following formulae for pastes. He divides pastes into those that are neutral (the first three) and those that are active (the last three formulae):—

- (1) Oxide of zinc, talc, and lanolin, vaselin, or oil; equal parts of each.
- (2) Oxide of zinc, talc, subnitrate of bismuth, and oil; equal parts of each.
- (3) Oil of cade 20 grammes.
Oxide of zinc 100 "
Vaselin or oil 100 "
- (4) Salicylic acid 2 "
Oxide of zinc 24 "
Starch 24 "
Vaselin or oil 50 "

(5) Resorcin	5 grammes.
Balsam of Peru	5 "
Oil of cade	5 "
Starch	10 "
Oxide of zinc	10 "
Lanolin or oil	10 "
(6) Ichthyol	1 gramme.
Precipitated sulphur	6 grammes.
Starch	10 "
Lanolin or oil	10 "

THE INTRAVENOUS INJECTION OF TINCTURE OF OPIUM (Injections intraveineuses de teinture d'opium). TASKIN. *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 139-141.

On account of lack of morphin and because of the uncertain effect of opium when administered by the mouth, Taskin tried tincture of opium intravenously in cases of colic. Small doses (10 to 30 c.c.) produced a sedative effect somewhat superior to that of morphin, preceded by a slight intoxication. Large doses (60 to 90 c.c.), in cases of violent colic or in order to produce narcosis to allow of an urgent operation, were not a success. The initial phase was followed by a period of excitation lasting some three hours, and marked by tetanic symptoms. The only sedative action was an almost complete cessation of peristalsis, often lasting six hours. Equivalent doses of morphin administered intravenously produced similar symptoms. 60 to 90 c.c. of alcohol gave symptoms of intoxication only.

It would appear that in colic the intravenous dose of tincture of opium ought not to exceed 30 to 40 c.c. (R. S. L.)

PHYSIOLOGY.

THE NORMAL BLOOD OF THE HORSE (Le sang normal du cheval. Sa densité et sa teneur en hémoglobine mesurée avec l'hémomètre Sahli). H. BONARD. *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 3. March 1919. Pp. 113-137. *Ibid.* No. 4. April 1919. Pp. 160-174. 2 Figures, 15 Tables.

The average specific gravity of the horse's blood ranges from 1048 to 1055. It is about 1054 in thorough-bred horses, 1050 in half-bred and 1048 in draught horses. It varies with age, being low during the first days of life and gradually rising to two or three years of age. It

diminishes at four years in imported horses; rises rapidly towards five years; increases a little up to fourteen years, and then diminishes as age advances. The specific gravity is higher (3 to 4) in the stallion than in the mare, but there is no difference between the gelding and the mare. The more a horse has of "temperament," the higher the specific gravity of the blood. The density of the blood varies with the time of day. It is at its highest between 11 A.M. and midday, and then falls rapidly until 2 P.M. During the afternoon it remains stationary until evening, when it falls again. It varies a little during the night, and rises rapidly during the morning until it reaches its maximum between 11 A.M. and noon. After great loss of water by perspiration, it is several hours before the blood regains its normal density. Moderate work that does not cause perspiration does not alter the density of the blood.

The hæmoglobin content of the blood of ordinary horses, measured by the hæmometer of Sahli, is from 50 to 60, and varies with the density under the influence of age, sex, temperament, time of the day, and perspiration. There is, however, an exception towards the age of fourteen years, when the density diminishes, but the hæmoglobin content continues to increase as age advances.

In plethoric horses the density of the blood and its hæmoglobin content undergo an increase in relation to the anatomical lesions. In serious cases they may attain 1069 and 100 respectively. In cases of anaemia, infectious or otherwise, density and hæmoglobin diminish in direct relation to the state of the disease. In severe cases they may be 1029 and 27. In cases of pulmonary emphysema and anaemia, the observation of the density of the blood and its hæmoglobin content is of great utility in diagnosis and prognosis.

OROKINASE AND SALIVARY DIGESTION IN THE HORSE, COW, AND PIG.

B. J. FINKELSTEIN. *Report New York State Vet. Coll., 1917-18.*
1919. Pp. 138-144. 6 Tables.

In connection with work that has recently been done upon salivary digestion in the horse, reference has been made to the presence or absence of a proenzyme formed in the buccal glands and said to activate the ptyalinogen of the parotid secretion to active ptyalin. "Orokinase" is a zymogen that is supposed to be secreted by the buccal and perhaps also by the lingual glands.

From this investigation it is concluded that the buccal glands of the cow, horse, and pig do not produce a zymogen "orokinase" which activates the ptyalinogen of the parotid saliva. Mixed saliva of the cow does not have any marked amylolytic activity, and lactic acid does not activate the saliva when it reaches the abomasum as has been

suggested. Ground oats and maize contain a reducing sugar which is not materially increased by digesting with the saliva of the cow. While the author failed to find zymogen granules in stained sections of the buccal gland, he points out that this negation is not conclusive. Extracts of the buccal glands of the horse failed to activate the extracts of the salivary glands or mucous membrane of the mouth. Glycerin extracts of the salivary glands, buccal glands, and mucous membrane of the mouth of the pig all tend to digest starch, producing a greater amount of reducing sugar than extracts of the glands of either the horse or the cow.

(R. G. L.)

THE VARIABILITY OF COWS' MILK. PART I.: THE AFTERNOON MILK.

H. S. HALCRO WARDLAW. *Proc. Linnean Soc., N. S. W.* Vol. LXII., No. 4. November 1917. Pp. 815-865. 6 Figures, 9 Tables.

Samples from 109 normal cows were examined. The most probable values of the quantities measured were:—Freezing point, $0\cdot562^{\circ}$ C.; density, $1\cdot0297$ ($25^{\circ}/25^{\circ}$); electrical conductivity, $4\cdot5 \times 10^{-3}$ reciprocal ohms; total solids, 13·24 per cent.; fat, 4·65 per cent.; solids-not-fat, 8·65 per cent.; lactose, 5 per cent.; ash, 0·72 per cent.; protein and extractives, 2·9 per cent. Physical properties were least variable quantities; percentages of materials in solution were much less variable than percentages of substances in suspension. Three per cent. of samples contained less than 3·2 per cent. of fat; 40 per cent. of samples contained less than 8·5 per cent. of solids-not-fat. (AUTHOR.)

VARIATIONS AND MODE OF SECRETION OF MILK SOLIDS. J. W. GOWEN.

Journ. Agric. Res. Vol. XVI., No. 3. 20th January 1919. Pp. 79-102. 12 Tables.

The investigation here reported was an attempt to analyse the variations and associations of the constituents of Holstein-Friesian milk. The mean annual production of pure-bred Holstein-Friesian cows was found to be 15,417 lbs. of milk, 528 lbs. of butter fat, 1303 lbs. of solids-not-fat at a mean age of four years. In comparison with other breeds, the average composition of the Holstein-Friesian milk was rather lower than that of most, both in the percentage of butter fat and in the total solids. Correlation figures show that, as the amount of milk given increases, the percentage composition of butter fat decreases. The correlations between the age of the cow and the amount of butter fat and between the amount of milk produced and the percentage of solids-not-fat are not significant. As the age of the cow

increases the percentage of solids-not-fat decreases. The morning milk is between 0·678 and 0·723 per cent. lower in butter fat than is the evening milk throughout the whole period of lactation; but no appreciable difference occurs in the solids-not-fat. In discussing these variations as affording support to the various theories of milk secretion, the author says: "Unless these mammary cells behave very differently in the formation of this fat than other body cells, this variation is enough to discredit seriously the hypothesis of cell disintegration to account for these milk solids and, in fact, to make it an absurdity. Furthermore, so far as our knowledge of the variations of secretory glands goes, the variations of the milk fall in well with the secretory hypothesis to account for these solids."

POULTRY DISEASES.

THE COLON-TYPHOID INTERMEDIATES AS CAUSATIVE AGENTS OF DISEASE IN BIRDS: I. THE PARATYPHOID BACTERIA. P. HADLEY, MARGUERITE W. ELKINS, and DOROTHY W. CALDWELL. *Bull. 174. Agric. Exp. Station, Rhode Island State Coll.* May 1918. Pp. iv + 216.

The aim of the work reported in this paper was (1) to secure a general survey of the typhoid-like and cholera-like bacterial diseases of poultry with special reference to those caused by organisms of the so-called paratyphoid group of the colon-typhoid-intermediates; (2) to ascertain the relation of the causative agents to each other, and to certain known bacterial species pathogenic for mammals and birds; (3) to study the carbohydrate fermentations and agglutination-affinities of these types as an aid (*a*) in establishing their interrelations, (*b*) in facilitating diagnosis, and (*c*) in laying a basis for the study of certain problems relating to toxicity and virulence.

Among the typhoid-like and cholera-like diseases of birds there are six main types: (1) Fowl cholera, due to *B. avisepticus* of the Pasteurella group; (2) fowl typhoid, due to *B. gallinarum* E. Klein, of the actual paratyphoid group; (3) paracolon infections, due to paracolon bacteria in the strict sense; (4) bacterial white diarrhoea due to *Bacterium pullorum* A; (5) infections of adult stock with *Bacterium pullorum* B; and (6) infection with intermediate strains whose position is not wholly clear. The bacteria related to these disease types respectively can be differentiated, morphologically, only in the case of *B. avisepticus*. In the other types, morphological differences afford only

an uncertain means of separation. Biochemically, however, these types can be distinguished from one another by the nature of their reaction in carbohydrate media. These specific differences are indicated in this paper.

Agglutination reactions were found to support the biochemical test with reference to the main types studied, but in addition they showed evidence of antigenic relation between types which differed markedly in their biochemical characters.

The rules of priority would establish the causative agent of fowl typhoid as *B. gallinarum* E. Klein, first described by Klein in 1889.

Pfaff's bacillus of "Kanarienvögelseuche" manifestly belongs to no type at present recognised; it possesses characteristics of both the fowl typhoid and the fowl cholera groups, and may be an intermediate. It is presented as a new species, *B. pfaffi*.

Up to the present, it has been believed that the development of necrosis along the needle track of intramuscular injections into pigeons was characteristic of *B. avisepticus* alone. The present work indicates that the same reaction may be obtained with other organisms. The chief difference in pathogenicity between the fowl cholera and fowl typhoid types is that, while the former are highly virulent and non-toxic, the latter are highly toxic and only slightly virulent.

The "haemorrhagic septicæmia group" of bacteria is a heterogeneous assortment of organisms, some of which are true paratyphoids, some true paracolons, some true *Pasteurella* types; and some which are outside any of these groups. It is concluded that the true septicæmia type of bacteria (*Pasteurella*) are not in any sense pleomorphic.

In fowl typhoid, it is suggested that in many instances in which the fowl typhoid bacillus or related paratyphoid or paricolon strains are isolated, these organisms are not the original cause of the disease, but this is to be sought in a filterable virus. It is thus suggested that in certain diseases among poultry, paratyphoid and paricolon bacteria may sometimes have the same relation to the disease that the hog cholera bacteria have to hog cholera; they are the agents of secondary infection, but in some instances may perpetuate an independent infection after their pathogenicity has been sufficiently increased through successive passages.

SURGERY.

THE ASEPTIC ABLATION OF THE COMPLEMENTARY CARTILAGE OF THE THIRD PHALANX (LATERAL CARTILAGE) (De l'ablation aseptique du fibro-cartilage complémentaire de l'os du pied par la voie cutanée: Technique). G. LENEVEU. *Rev. Gén. Méd. Vét.* Vol. XXVIII, No. 328. April 1919. Pp. 177-181.

The operation herein described consists of the aseptic extirpation, partial or complete, of the complementary cartilage of the third phalanx through a cutaneous opening made above the coronet. It is a conservative operation, so devised that the integrity of the hoof, keraphyllous tissue, and coronary band may be maintained. This route of access to the cartilage was followed by Huzard and Pagnier (Cadiot and Almy, *Thérapeutique chirurgicale*, ii. 657), and has been revived during the war, notably by Perrier. Perrier's operation (see this *Review*, 1917, I. 153), however, involves the sacrifice of a portion of skin; a loss that is avoided by Leneveu.

The operation has been performed three hundred and fifty times by Leneveu. The field of operation is prepared by clipping the hair from the whole region between the coronet and the upper third of the metacarpus. The skin is well soaped and washed, and the hair is shaved from a considerable area about the seat of operation. The skin is then dried and painted abundantly with 95 per cent. alcohol or weak tincture of iodin. An incision through the skin is carried from the level of the anterior-superior angle of the cartilage, or very slightly behind this, backwards to the heel, about one centimetre from the margin of the hoof, and parallel thereto. Where the operator is content to remove not more than a part of the cartilage, the skin incision is correspondingly reduced in extent; but in every case facility of execution of the various operative manœuvres must be kept in view. The cartilage is then freed from the overlying tissues by means of a straight bistoury, care being exercised to preserve the whole thickness of the skin and to avoid wounding the coronary cushion and the keraphyllous tissue. If partial removal of the cartilage is to be performed, only that part will be freed that is to be removed. The cartilage is removed by means of a sage knife, right or left, as the case may demand. The author removes an ossified cartilage layer by layer with a gouge 8 millimetres wide. Curetting is then performed with a small Wolkmann's curette, and Leneveu holds it to be an excellent practice to complete the operation by applying the actual cautery whenever this appears to be necessary. The operation wound is protected, and the sole of the foot rendered aseptic, before the application

of a shoe with a metal sole. The branch of the shoe that corresponds to the quarter upon which the operation has been performed should be prolonged in such a manner as to afford support to dressings. The operation wound is irrigated with warm saline solution, dried thoroughly, and then tightly packed with aseptic tow, its neighbourhood painted with alcohol or tincture of iodin. The whole foot and pastern is swathed in tow held in place by bandages 7 centimetres wide.

It is claimed that a dressing properly applied after an operation correctly performed may, generally speaking, be left as long as one wishes. As a rule, suppuration is practically negligible.

IDIOPATHIC EMPYEMA OF THE SINUSES OF THE SKULL (Considérations sur l'empyème idiopathique des sinus et principalement sur le traitement des cas rebelles dus à l'empyème des cornets). J. HAMOIR. *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 10th October 1918. Pp. 404-436. 9 Figures. (Translation in *Vet. News.* Vol. XVI., No. 786. 25th January 1919. Pp. 29-32. *Ibid.* No. 790. 22nd February 1919. Pp. 63-65. *Ibid.* No. 791. 1st March 1919. Pp. 73-75. *Ibid.* No. 795. 29th March 1919. Pp. 105-108. *Ibid.* No. 796. 5th April 1919. Pp. 113-114).

The author deals in the first place with the normal anatomy of the paranasal sinuses, pointing out that, while their general arrangement and interrelations are constant, their relations to the bones of the skull are subject to some variation. The fact that the posterior and anterior maxillary sinuses have a common opening into the nasal cavity is emphasised, as being of moment in connection with occurrence of simultaneous disease of the two sinuses. Empyema of the sinuses may be due to trauma, tumours, disease of the teeth, or glanders. Tumours are usually malignant and arise either from the mucous lining of the sinuses or from their bony walls. Empyema of dental origin has been dealt with in a previous paper ("Étude sur les affections dentaires et parodontaires du cheval," *Rec. Méd. Vét.*, 1917, xciii. 383-431).

Idiopathic empyema is sometimes primary, but in the majority of instances it is secondary to a purulent process (as in strangles) in the mucous membrane of the nasal cavity. The conformation of the sinuses renders spontaneous evacuation of the pus impossible, and even by the classical operation of trephining it may not be possible to effect adequate drainage. War experience has shown that the mucous lining of the sinuses can deal effectively with ordinary traumatism, but prolonged contact with pus causes it to become greatly thickened and velvety in character. The pus in empyema may vary in amount. It is often fluid towards the upper part of the sinus, and thick or even caseous in

the lower part. When the opening into the nasal cavity is occluded there may be gases under pressure in the highest part of the sinuses. An operation by trephining that does not effect a complete cure of the condition may lead to the formation of a fistula with indurated and invaginated borders. From this, richly vascular tissue invades and fills the sinus. The granulations bleed freely on being handled and may be so abundant as to entirely obliterate the sinus cavity. Thus has arisen the erroneous view that granulations may finally effect a complete cure of the disease.

As a complication of empyema, necrosis and distortion of the turbinated bones may result with partial atresia of the nasal cavity. Owing to the greater thickness and resistance of the outer wall of the sinus, necrosis and deformity on the surface of the face is less common and later in occurrence. In rare cases the granulations within the sinus become confluent and sclerosed.

The symptoms and diagnosis of uncomplicated empyema are briefly discussed, and it is pointed out that, after operation, the discharge may persist for more than four or five weeks. But if the discharge persists for more than three weeks, although the infections readily escape by the nose, the surgeon should suspect the presence of a diverticulum in the sinuses. Such a diverticulum may be present in the lower part of the anterior maxillary sinus, or there may be a deep recess in the posterior part of the turbinated bones.

If the disease of the sinuses persists in spite of treatment, and is not due to alveolar dental disease, the presence of a foreign body, or a dilatation of the anterior maxillary sinus, the surgeon may conclude that there is empyema of the turbinated bones. This may be so whether there is or is not what the author calls a nasal "souffle."

In trephining the maxillary sinuses the author advises that, in all cases, a large opening should be made on a level with the septum between the posterior and anterior sinuses. Even though the anterior maxillary sinus is healthy, it is advisable that it should be opened and the septum broken down so that there may be a free communication between the two sinuses. The author is apparently not greatly in favour of trephining the frontal sinus, for he suggests that if irrigation is practised through the frontal sinus infection may be spread to the upper turbinated bone. It is necessary to make sure that the opening from the sinuses into the nose is patent, and that irrigation fluids will flow freely by way of the nostril.

In cases where there is dilatation of the anterior maxillary sinus, the author does not approve of the method of treatment suggested by Siedamgrotsky and Cadiot. His own method is to trephine along a line that continues the facial or zygomatic crest, or slightly above this line.

In those obstinate cases due to empyema of the upper turbinate bone, the author recommends the following procedure. About 4 centimetres from the middle line of the head and on a line joining the nasal angles of the two eyes, the nasal bone is trephined. A second opening is made about half a centimetre in front of the first, and a third a like distance from the second: all the openings being the same distance from the middle line. The three trephine openings are now joined into a common opening by the removal of the portions of bone between them. The sinus of the turbinate bone is then cleaned and disinfected. The second part of the operation is the removal of several square centimetres of the floor of the sinus, thus producing a large communication with the nasal cavity. If the empyema affects the lower turbinate bone, a somewhat similar procedure is followed, the object being to secure free drainage into the nose.

SHOES FOR THE TREATMENT OF CONTRACTED FOOT (Les "fers incomplets" dans le traitement de l'encastelure). FRANC. *Rec. Méd. Vét.* Vol. XCV., No. 7. 15th April 1919. Pp. 207-217. 2 Figures.

In the opinion of Franc, most cases of contracted feet are due to bad shoeing, *i.e.* to removal of frog pressure, the insertion of nails on the inside (medial) quarter of the wall, etc., leading to atrophy of the digital torus (plantar cushion). Attempting to remedy this condition, he experimented for some years with what he describes as "incomplete shoes," that is, shoes in which one branch is missing to a great extent. The missing branch is usually the inner one, as the relative thinness of the wall at the inner quarter lends itself to a greater degree of movement than is possible at the outer quarter. The shoe has but three to four nails on the outer side and one to two on the inner, the latter being placed close to the toe. The outer branch of the shoe is continued across to the inner heel, forming a bar on which the frog should bear fully and squarely. By these means all bearing is taken off the inner wall, and the plantar cushion is allowed a very considerable amount of expansion.

In Franc's opinion the results are very satisfactory, benefit being especially marked during the first four months of treatment. Where contracted feet are associated with fully developed sidebones, and where inflammatory conditions such as "navicular disease" are present, treatment by means of "incomplete shoes" is of course doomed to failure.

(R. S. L.)

BACTERIAL INFECTION OF WOUNDS IN FRANCE. J. ROBSON. *Vet. Record.* Vol. XXXI., No. 1602. 22nd March 1919. Pp. 325-327.

Robson has no hesitation in saying that the so-called "fibrous" or "bacterial neck tumours" are not really bacterial in origin, and, with

proper treatment, should never become infected. He regards the secondary unsightly fibrous thickening as the result of either too timid treatment or of treatment vastly over-zealous. He regards the etiology of the condition as depending upon the injury and tearing of the subcutaneous areolar tissue, with laceration of minute blood vessels, especially veins, and injury to lymphatics. Later there is inflammation with effusion into the areolar spaces, and subsequent separation of the skin from the underlying muscle. The most important factors determining the size of the swelling are the amount of torn areolar tissue and the bruising or thrombosing of return vessels. The swelling, if of small size and left alone, usually disappears in a few days. Larger ones tend to increase slowly but surely. If the swelling is small, leave it alone. If it is of larger size and not likely to disappear naturally within a reasonable time, it should be opened. The surface of the skin is swabbed with iodin, and a free incision is made generally from the centre of the swelling to its lowest point. On no account should an exploration be made. Twice daily the swelling is gently pressed to remove fluid, and the lips of the wound are swabbed with tincture of iodin.

BISMUTH-IODOFORM-PARAFFIN PASTE IN THE TREATMENT OF WOUNDS.

1. "‘Bipp’ Treatment." E. S. W. PEATT. *Vet. Journ.* Vol. LXXV., No. 5. May 1919. Pp. 163-173.
2. "B.I.P.P. Treatment of Wounds." H. B. EVE. *Ibid.* P. 174.

1. The method of preparation of "bipp" is given by Rutherford Morison in *Brit. Med. Journ.*, 1917, ii. 573-586 (see this *Review*, 1918, II. 66). Peatt now writes in appreciation of the good results attending its use in veterinary surgery. He regards the method of treatment of wounds as a most useful innovation in surgery of the lower animals, and sustains the following points as being in its favour:—The paste remains in a wound longer than other antiseptics. Wounds do not require dressing so often. The paste is non-irritant to the tissues, as shown by the fact that it can be sutured up in a wound and healing by first intention will take place. It appears that there may even be a sedative action. Healing of a clean operation wound by first intention is more certain than by other methods of treatment. The results are excellent. The high cost of the paste is more than compensated by the fewer number of dressings required and the rapidity with which healing takes place.

Peatt contrasts and compares the "bipp" and the "Carrel" methods, both of which, he asserts, give excellent results. While "bipp" may be used with any form of wound, the "Carrel" treatment cannot,

because of the difficulty of keeping the tubes fixed in the wound. "Bipp" is more suitable in punctured wounds from which there is not an excess of purulent discharge, and which can be plugged. It is also preferable in operation wounds. The "Carrel" treatment, on the other hand, is more effective in cases of the more septic and larger type of wounds in which there is profuse purulent discharge. In "bipp" treatment fewer dressings and less attention is required: thus the cheapness of eusol is balanced. In most cases "bipp" gives more rapid results than the "Carrel" treatment.

The report is accompanied by a summary of the results of sixteen cases treated by "bipp."

2. Eve reports toxic effects produced by the use of "bipp" in the treatment of a large lacerated wound in a dog. The symptoms were salivation, erythema, pruritus, stomatitis, purulent conjunctivitis, extreme thirst, obstinate constipation followed by diarrhoea and foetid stools, sour smell of the mouth, anaemia, arched back, rough and staring coat, twitching of muscles, acceleration of the pulse, elevation of the temperature, impairment of the appetite, and scanty urine that was sometimes suppressed.

[Among recent papers on the use of "bipp" are the following:—Rutherford Morison, *Lancet*, 12th August 1916; Louisa Garrett Anderson and Helen Chambers, *Lancet*, 1917, excii. 331-333 (*Review*, 1917, I. 287); Rutherford Morison, *Journ. Roy. Army Med. Corps.*, 1918, xxx. 306-319; and F. T. Harvey, *Vet. Record*, 1918, xxxi. 161-164 (*Review*, 1919, III. 129).]

Toxic effects have been reported in man by F. A. Hepworth, *Lancet*, 1917, excii. 573-574 (*Review*, 1917, I. 353).]

SPECIFIC SEROTHERAPY IN WOUNDS AND PYOGENIC INFECTIONS (Sérothérapie spécifique des plaies et infections pyogènes). A. GUILLAUME and G. BITTNER. *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 327. March 1919. Pp. 113-136.

In a previous communication (*Rev. Gén. Méd. Vét.*, 1917, xxvi. 67-79; this *Review*, 1917, I. 286), Guillaume and Bittner have reported on the satisfactory results obtained by the use of the polyvalent serum of Leclainche and Vallée in the local treatment of wounds of various kinds. The present paper contains a further account of wounds of diverse character (ligamentous, tendinous, articular, osseous, cartilaginous, "quittor," etc.) treated in this manner. In wounds of long standing, where the formation of new tissue interferes with the intimate contact of the serum, success is slow, though improvement is immediate. In such cases, the employment of the serum along with surgical intervention form a perfect combination. In serious wounds an alteration is

perceptible in forty-eight hours. In conditions such as infectious polyarthritides of foals, distemper in dogs, etc., the beneficial action of the serum is beyond doubt.

The serum treatment produces an immediate disappearance of the inflammation caused by traumatism, and is followed by cellular proliferation. Where the gravity of the condition depends more on the action of secondary organisms (staphylococci, streptococci, etc.) than on specific germs themselves, the serum of Leclainche and Vallée is very efficacious. In all cases its curative action is rapid and perfect, it produces the minimum cicatrix in the minimum of time, and is therefore economical.

OBSTRUCTION IN THE SHEATH OF THE OX. J. M. SINCLAIR. *Rhodesia Agric. Journ.* Vol. XVI, No. 1. February 1919. Pp. 37-38.

Cases of obstruction in the prepuce of the ox have been reported from time to time, but recently a large number occurred. In one herd over twenty animals were affected within a week or two. There seems some reason for assuming that the cases are met with about the same time of the year—namely, at the beginning of the rains; and it is possible that the new grass may cause an alteration in the composition of the urine.

Whatever contributory causes there may be, it is clear that the structural peculiarities of the parts, following the operation of castration, are the main factors. The diminutive penis is not protruded, and urine is voided into the prepuce. The decomposed urine, mixed with smegma, produces inflammation of an intense kind followed by ulceration; and the accumulation of decomposed urine, pus, and smegma finally blocks the preputial orifice. Eventually there are symptoms of pain that indicate distension of the bladder, which, if not promptly relieved, ends fatally.

In the early stages, syringing out with soap and water may prevent further trouble. In later cases, where irrigation is difficult or impossible, an incision should be made from the preputial opening, along the middle line, and the accumulated material removed. Thereafter, the cavity is daily syringed with a warm solution of permanganate of potassium or sulphate of zinc.

EPIZOOTIC INFLAMMATION OF THE INTERDIGITAL SINUS OF SHEEP (Inflammation du sinus biflexe à forme épidémiologique chez le mouton) CURASSON. *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 268-273.

Curasson notes a disease of sheep, fairly common in the French African colonies, which, on account of its apparently epizootic character .

and high fatality, is worthy of being recorded. His observations extended over some 1200 patients. Lameness, more or less pronounced, usually affects one fore leg—rarely a hind one. Examination reveals the foot itself to be in good order. The interdigital space, however, shows an ulcer discharging pus that is at first creamy in colour, but later is often more liquid and foul-smelling. At times the appearance of a large quittor, affecting the internal surface of both coronets, is produced. In neglected cases, the metacarpo-phalangeal joint is affected, and later opened, the ulcer reaching the size of a shilling. The interphalangeal articulations are more rarely affected. Should neglect be continued and the animal not die beforehand, the carpal region becomes the site of sores, due to the animal moving about on its knees to save the feet. Through inability to gather food, death is common. Death from metastasis is rarer—some 10 per cent.

If the joints do not become affected, it is not uncommon for an animal to recover completely in some three or four months. Death is the rule when the joints are affected. High morbidity characterises the disease, 37 to 66 per cent. of all animals being affected. The death-rate is 8 per cent., though probably higher, as many animals are slaughtered for food in the earlier stages of the condition.

The causal agent is *B. necrosis*, combined with other organisms. The inoculation of sheep subcutaneously usually produced an abscess, containing the same type of pus, at the site of inoculation. Intravenous inoculation was practised in one case only. The inoculated animal was slaughtered some twenty-five days later, and post-mortem examination revealed several nodules in the lungs, each containing similar pus. Out of eight cases inoculated in the interdigital space by scarification, one only developed lesions of any importance. In two cattle local inoculation produced only rapidly-healing ulcers.

Natural infection appears to be local and induced by the bite of ticks, or through slight wounds produced by stiff stalks of grass, etc. Diagnosis depends upon the local symptoms and the apparently epizootic character of the disease. With early treatment, prognosis is favourable —otherwise, bad. Treatment consists in cleansing the lesions, etc., followed by the application of a 2 per cent. solution of copper sulphate on cotton-wool. Affected and healthy animals should be separated.

(R. S. L.)

A METHOD OF OPERATING SCROTAL HERNIA IN BOAR PIGS TO SAVE THE TESTICLE. H. S. MURPHY. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 1. April 1919. Pp. 62-64.

The animal is kept on a low diet for one or two days, and, if the abdomen is full, a dose of physic is given. After lavage, 4 to 6 grammes

of chloral hydrate for every 50 lbs. weight of the animal is given per rectum. In twenty to thirty minutes the patient is ready for the operation. The pig is placed on its back with the high quarters raised to an angle of 35 to 45 degrees. The following instruments are necessary:—Scalpel, three or four haemostats, hernia clamp, catgut and a Peter's ligature needle, Carson's special curved ligature needle, two suture needles, and silk or linen suturing material. The hernia is reduced by manipulation. A liberal incision is made over the external ring through the skin, fat, and fascia, so as to expose the tunica vaginalis and the muscular wall of the abdomen in front of the ring. The vaginal tunic with the contained spermatic cord is separated from the underlying tissue, and grasped just posterior to the external inguinal ring. The handling must be done with care, so as to avoid irritation that might result in subsequent adhesions. “Locate the spermatic cord in the posterior part of the tunic. . . . Pick up the common tunic with the right hand while the left hand holds the spermatic cord posteriorly; have an assistant place the clamp longitudinally on the tunica vaginalis communis, so that the canal will be obliterated both longitudinally and transversely. Before the clamp is tightened, draw the tunic downwards out of the canal as far as possible without injuring the peritoneum, clamp tight, and suture tunica vaginalis communis close to the clamp with catgut, using the lock-stitch. Remove the clamp and allow cord to return into the inguinal canal. It is now advisable to push the spermatic cord downwards and medially, so that the anterior portion of the external ring may be sutured. Two or three strong retention sutures are put in merely to hold the parts rigid until the inflammatory reaction will cause enough adhesions to keep the canal closed. Touch edges of skin with tincture of iodin and suture, using Glover's stitch No. 2, also known as the whip-stitch. Suture should be left in from seven to ten days, the animal forced to take some exercise, given light fluid or semi-fluid diet.”

TOXICOLOGY.

THE CONNECTION OF MILKSICKNESS WITH THE POISONOUS QUALITIES
OF WHITE SNAKEROOT (*Eupatorium urticaefolium*). W. G.
SACKETT. *Journ. Inf. Dis.* Vol. XXIV., No. 3. March 1919.
Pp. 231-259.

Recently published reports of experimental work point to *Eupatorium urticaefolium* as the true cause of “trembles” in animals, but Sackett was of the opinion that the inconclusive character of some of the experiments warranted a further examination of the subject.

Several possibilities presented themselves to him. Firstly, specific organisms may be present on the plants, which, when ingested by the lower animals, develop a toxin that produces the symptoms observed. In the second place, there may be micro-organisms growing in or on the plants, and there producing poisonous substances in the tissues. Or, thirdly, there may be present in the plant itself some active poisonous principle, perhaps of the nature of an alkaloid or glucoside, that may be responsible for the trouble. It was with the last-mentioned possibility that the work of Sackett was particularly concerned.

Rabbits, guinea-pigs, and cats were used as experimental animals. The first were fed with the green plants, dried powders, and different extracts of the plant. The guinea-pigs received the dried powders and extracts only; and the cats were given the viscera and meat from the rabbits that died during the course of the experiments. The following summary of the results is given by the author:—

“ Both the fresh, green *Eupatorium urticæfolium* and the dried leaf powder contain an active ingredient which is poisonous for rabbits. The active poisonous principle is present in plants grown in the greenhouse as well as under natural out-of-door conditions. The active constituent is soluble in 95 per cent. alcohol, and its solution yields a solid extract on evaporation which is poisonous for rabbits but not for guinea-pigs. The active ingredient is soluble in a mixture of ether-chloroform and ammonia, and its solution yields a solid extract on evaporation which is poisonous for rabbits but not for guinea-pigs. The active ingredient is not yielded by extraction with physiologic salt solution. The active principle is present in the leaves, but not, or only sparingly so, in the stems and roots of dried plants. There is no indication of anaphylaxis. So far as is shown by these experiments, neither the leaf powder nor the different extracts are poisonous for guinea-pigs. The viscera and meat from rabbits which had died from *Eupatorium* poisoning, when fed to a cat, were without harmful action. No difference in poisonous properties could be noted between plants from a ‘milksick’ and ‘non-milksick’ area. . . . The principal pathologic changes occur in the kidney, liver, and heart, where fatty degeneration and hyperæmia are very marked. Poured agar plates made from the heart blood, liver, and kidneys were invariably sterile.”

The author states that it is not his intention to claim that all cases of disease with the symptoms of “trembles” or “milksickness” are due to the ingestion of the toxic substance of *Eupatorium urticæfolium*; for Jordan and Harris have reported that a similar disease with similar if not identical symptoms occurs in a region in New Mexico where *Eupatorium* is not present.

[Other recent papers on this subject have appeared as follows:—

Curtis and Wolf, *Journ. Agric. Res.*, 1917, ix. 327-404 (this *Review*, 1917, I. 422). Wolf, Curtis, and Kaupp, *Journ. Amer. Vet. Med. Assoc.*, 1918, lii. 821-827; *Journ. Comp. Path. and Therap.*, 1918, xxxi. 51-58; *Tech. Bull. No. 15*, North Carolina Agric. Exp. Station, 1918 (this *Review*, 1918, II. 409 and 485). Marsh and Clawson, *Journ. Agric. Res.*, 1917, xi. 699-715 (this *Review*, 1918, II. 267). Moseley, *Med. Record*, 1917, xcii. 428.]

CYANOGENESIS IN *ANDROPOGON SORGHUM*. C. T. DOWELL. *Journ. Agric. Res.* Vol. XVI., No. 7. 17th February 1919. Pp. 175-181. 1 Table.

While it is well known that the sorghums contain a cyanogenetic glucoside, opinions differ regarding the toxicity of the plant after it has been cut and dried. Investigation is necessary to determine whether or not the glucoside is decomposed and the prussic acid liberated when the sorghum is cured; whether the enzyme becomes inactive in the process of curing as has been claimed; to study the effect of the presence of substances such as glucose and maltose on the liberation of the hydrocyanic acid from the glucoside and to ascertain whether or not the acid may be present in a glucosidic and a non-glucosidic form. It was found that approximately three-fourths of the acid is set free in the process of drying, apparently therefore sorghum is safe for feeding after it has been dried. The rapidity with which the plant is dried materially affects its toxicity. Sorghum that has become partly dried while still standing owing to drought, dries very quickly when cut and it is such fodder that contains most acid. "The addition of such a small quantity as 1 per cent. of dextrose and 1 per cent. of maltose seems to hold back or prevent the liberation of about three-fourths of the acid. This is an extremely important result from the practical standpoint. Dextrose and maltose were selected because of the fact that they are formed by the action of the ptyalin on the starches in the paunch" (?)

It is suggested that the retention of the acid may be due either to a reaction between the sugars (aldehydes) and hydrocyanic acid or to lessening of the activity of the enzyme by the sugars. The feeding of some concentrate before giving the sorghum where there is any doubt concerning the toxicity of the latter is therefore indicated, the argument being that considerable quantities of dextrose and maltose would be produced by salivary digestion. Search for non-glucosidic acid was negative. It has previously been shown that as sorghum matures the quantity of acid lessens, the author thought that this might not hold true if owing to drought the plant had already stored a large amount; an experiment with a suitable sample showed that nearly all the

acid had disappeared as is the case with plants not affected by drought.
(R. G. L.)

WILD THYME POISONING IN Two MULES (Empoisonnement de deux mulets par le thym serpolet). BAILLY. *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 326. February 1919. Pp. 75-76.

Two mules that had been put on to a pasture to graze, ate a quantity of wild thyme; both of the animals died. The field was of poor clay soil and the thyme was the dominating plant. Animals as a rule decline to eat this plant owing to its strong smell, and it is supposed that the shortage of forage during the winter explains the avidity with which on this occasion it was consumed. The toxic effects are described as a sort of fatal drunkenness with partial muscular and sensory paralysis. The animals seemed to lose all sense of pain. Treatment, which included bleeding, the hypodermic administration of pilocarpin, the application of hot vinegar to the abdomen with friction and cold water to the head, was without avail and both animals died from five to seven hours after the onset of the symptoms. The post-mortem examination revealed a few petechiae and ecchymoses in the mesenteries of the large and small bowel, and the meningeal veins were dilated and full of blood. In the intestine there was a strong smell of thyme and post-mortem intestinal fermentation was arrested, due probably to the antiseptic action of the oil of thyme. (R. G. L.)

TUBERCULOSIS.

PASSIVE ANAPHYLAXIS FOR THE RECOGNITION OF TUBERCULOUS MEAT (L'anafilassi passiva pel riconoscimento delle carni tubercolotiche). L. GRANUCCI. *La Clinica Vet.* Vol. XLII., No. 4. 28th February 1919. Pp. 115-126.

The experimental observations of the author have shown that the muscle plasma of cattle affected with tuberculosis, in an advanced or medium degree, injected once into rabbits, induces a condition of hypersensitivity, so that subsequent injection of tuberculin produces passive anaphylaxis of a grave character. This reaction may be regarded as specific, because control rabbits, injected with muscle plasma of healthy cattle, do not react, or present very slight disturbance. The anaphylactic state may be transmitted to other healthy rabbits, but the condition is less intense. In both cases the passive anaphylaxis is accompanied by hyperthermy. The reaction may be of use to meat

inspectors who have to determine whether meat is tuberculous in cases where the viscera are not available, and where the lymph glands of the part are not involved.

EXPERIMENTAL STUDY ON THE THERAPY OF TUBERCULOSIS (*Étude expérimentale sur la thérapie de la tuberculose*). G. VOLPINO.
Ann. Inst. Pasteur. Vol. XXXIII., No. 3. March 1919. Pp. 191-196.

Having observed in previous experiments that xylol had an effect on tuberculous processes, Volpino instituted a series of experiments to test more accurately the action of the substance. His first experiments in this direction were made on twelve guinea-pigs, all of about the same weight, and all inoculated with tuberculous sputum fairly rich in bacilli. Four days after infection, six of the guinea-pigs were submitted to periodic injections of xylol; the other six animals being kept as controls. One of the six guinea-pigs receiving the injections of xylol died on the twenty-fifth day (probably from intoxication), without presenting any post-mortem lesions other than a very small nodule in the peritoneum. The other five animals developed very trifling increase in size of the palpable lymph glands, and, when killed forty-six days after infection, presented much less marked internal lesions than were found in the control animals. Further experiments showed that if the xylol injections were begun in guinea-pigs, not too seriously infected, on the eighth to tenth day after infection, it was possible to keep these animals alive until the fortieth day without the manifestation of more than limited signs of infection. Whereas, in control animals, very visible external and very wide-spread internal lesions developed by the fifteenth or eighteenth day after infection.

Other hydrocarbons (toluene, cumene, etc.) were similarly tested with somewhat similar results. Curative treatment by the intra-muscular injection of xylol and cumene (trimethylbenzene) has also been tried in the human subject with encouraging results. The injections were first made in doses of 0·5 to 1 c.c. of the undiluted drug, but this was found to induce local pain and some fever. More frequent doses of the hydrocarbon diluted to 10 per cent. with sterilised olive oil could be made without the production of either pain or fever.

REPORTS.

BOARD OF AGRICULTURE AND FISHERIES: ANNUAL REPORT OF PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS, ETC., FOR THE YEAR 1918. London: Published by His Majesty's Stationery Office, 1919. Pp. 30. 3d. nett.

During the year three outbreaks of foot-and-mouth disease were confirmed, but these were substantially one outbreak only, disease having occurred on three separate sets of premises farmed by the same farmer and his sons. There was a further very decided fall in the number of confirmed outbreaks of anthrax, the total for 1918 being 245 as against 421 in 1917. The reduction in the number of confirmed outbreaks in Scotland was very marked. There has been a slight increase in the number of outbreaks of glanders and farcy, occurring otherwise than among army horses; the total for 1918 being 34 as against 25 in 1917. The increase occurred in the county of London, the figures for other parts of the country being substantially unchanged. Parasitic mange in horses owned by civilians is rapidly increasing, the total number of outbreaks reported for 1918 being 4483, as against 2614 in 1917, and 2147 in 1916. The highest number of outbreaks reported by any one authority is that for London. There has been a further reduction in the number of outbreaks of sheep scab (352 for 1918, as against 543 for 1917); and there is again a reduction in the number of confirmed outbreaks of swine fever (1407 for 1918, as against 2104 in 1917).

The story of the occurrence of rabies in Devon and Cornwall, up to the end of the year, is given in some detail. The first intimation of the suspected existence of the disease in the neighbourhood of Plymouth was received in 19th August, and the case was confirmed on 7th September. This case proved to be the forerunner of a very serious outbreak that had not been mastered by the end of the year. A small committee of inquiry concluded (1) that the disease existed in Plymouth in the middle of May, and (2) that it was brought in by an imported dog which, owing to conditions arising out of the war at Plymouth, escaped the attention of the authorities.

The statistical matter that in normal times accompanies this report has again been greatly curtailed.

ACREAGE AND LIVE STOCK RETURNS OF SCOTLAND. AGRICULTURAL STATISTICS, 1917. Board of Agriculture for Scotland. Vol. VI., Part I. 1919. Pp. 53. 3d. nett.

In 1917 the total number of horses of all classes in Scotland was 210,048, an increase of 2758 on the year, and of 11,344 on the number returned for 1915. Horses used for agricultural purposes, including mares kept for breeding, numbered 135,418, showing an increase of 1955, or 1·5 per cent. over 1916, but a decrease of 10,377, or 7 per cent., as compared with the decennial average. Unbroken horses (exclusive of stallions), which numbered 49,572 as compared with 48,284 in 1916, showed a net increase of 1288.

The total number of cattle in 1917 was 1,209,859, and showed a decrease of 16,515, or 1·3 per cent., as compared with 1916; but an increase of 9522, or 0·79 per cent., as compared with the average of the previous ten years.

The total number of sheep returned was 6,873,234, fully 180,000 fewer than in the previous year. This reduction was mainly due to the heavy decrease in the number of lambs, a condition that obtained also in 1916, although not to the same extent.

Pigs numbered 132,945, a decrease of 13,445, or 9·2 per cent., as compared with 1916, and a decrease of 14,434, or 9·8 per cent., on the ten years' average.

UGANDA PROTECTORATE: ANNUAL REPORT OF THE CHIEF VETERINARY OFFICER (E. HUTCHINS, M.R.C.V.S.). ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE FOR THE YEAR ENDED 31st MARCH 1919. Pp. 36-41.

This report contains an account of the prevalence and distribution of disease among animals in Uganda during the year 1917-18. In that year rinderpest did not cause severe losses except in the districts of Lango and Bukedi, but it is anticipated that the introduction of the disease into the game in Bunyoro will lead to heavy losses in the Western and Buganda Provinces.

In connection with the treatment of trypanosomiasis, one cow infected with *Trypanosoma pecorum* was given subcutaneous injections of *soamin*, in doses of 5 grammes at ten days' intervals. The first injection was given on the 26th June and the last on the 20th December. Daily examinations of fresh blood were made throughout this period, and trypanosomes were found on the 24th, 25th, and 26th June, on the 4th, 12th, 14th, and 23rd July, and on the 15th August. The cow made a complete recovery and remained in milk up to December.

An experiment was made to ascertain if the virulence of *T. pecorum*

for cattle could be reduced by passage through goats. A virulent strain was obtained and sub-cultivated through four goats, and then introduced into a young bullock. No modification in virulence was observed. The bullock died from trypanosomiasis on the 40th day after inoculation.

During outbreaks of trypanosomiasis in Kampala, trained fly boys were employed to accompany the cattle while grazing, but the only biting flies obtained in any numbers were *Stomoxys calcitrans*, which were extremely numerous.

An outbreak of dermatitis occurred in a dairy herd in Kampala. The skin lesions were very numerous and in the form of circular necrotic areas. A streptothrix was found in smears from these lesions.

It is reported that since 1916 in North-east Bugishu not less than three-fourths and possibly as much as four-fifths of the goats in that division have died of scab. Sheep do not appear to have been affected.

CEYLON ADMINISTRATION REPORTS FOR 1918. REPORT OF THE GOVERNMENT VETERINARY SURGEON (G. W. STURGEON, M.R.C.V.S.) FOR 1918. Pp. 6.

There was a marked decrease of rinderpest during the year, the total number of cases being 161, as against 2076 in 1917. Foot-and-mouth disease was very prevalent throughout the year, and, except the southern, all provinces were infected. The total number of cases was 10,377, as against 7132 in the previous year. In the provinces, 24 cases of anthrax were reported, and 3 in Colombo town. At the quarantine station, there were 1302 cases in goats and sheep imported from South India.

There were no cases of piroplasmosis or surra, and, except for one case of anthrax, there was no outbreak of infectious disease in horses.

Forty-four positive cases of rabies were diagnosed. Only thirty cases of swine septicaemia were reported, and there were thirty cases of blackleg.

BIENNIAL REPORT OF THE STATE BOARD OF STOCK COMMISSIONERS, STATE OF NEVADA, 1917-18. "Activities of the State of Nevada in the Recognition and Control of Infectious Diseases of Animals for the Years 1917 and 1918." By EDWARD RECORDS, V.M.D.

During the years covered by this report there has been no conspicuous outbreak of contagious disease affecting any large area of the State, and conditions as a whole may be described as having been normal. Losses have occurred in certain localities, notably from an-

thrax; but the actual losses from this disease have been small owing to the fact that those using infected lands for grazing purposes have been made familiar with the nature of the disease and have almost universally immunised their stock early in the season before turning them out on the dangerous lands. In the late summer of 1917 there was a recurrence of anthrax in a locality (Truckee Meadows, near Reno) where the disease had caused considerable loss in the past, but had lain practically dormant for several years. It suddenly reappeared in a virulent form, causing a high death-rate in both cattle and horses. The outbreak was controlled with great difficulty as the use of vaccins and serum for immunisation purposes did not yield results as promptly as usual. At the same time the disease was raging over a large area in central California where similar difficulties in control were experienced. There was an additional complication during this outbreak due to the fact that in two dairy herds where the disease had not actually appeared, but which were more or less exposed to infection and vaccinated as a precaution, there was a violent reaction and several deaths occurred directly due to vaccination. Two methods of vaccination are now used in the control of anthrax: the double or Pasteur vaccin, consisting of two graduated doses given about ten days apart, and the sero-vaccin or simultaneous method by which a dose of rather strong vaccin and a small dose of serum are given at one operation. Both methods have their advantages. The former is cheap, almost harmless, and confers a high degree of immunity; but it necessitates two operations and takes at least three weeks to establish immunity, during which time the animals are even more susceptible to infection than if they had been untreated. The simultaneous method costs more for material and has a slight element of risk, the vaccin occasionally causing a severe reaction and even death. The method, however, requires only one operation and confers immunity somewhat more quickly than does the double method. In addition, anti-anthrax serum is used to some extent, especially in herds where the disease has already appeared. This is harmless and confers an almost immediate, but short, immunity.

In the control of blackleg, the newer or filtrate vaccin (see this *Review*, 1917, I. 405; 1918, II. 443) has been largely used, experience seeming to show that it is absolutely safe and much more uniform and efficient in its action than the pellet vaccin heretofore used almost exclusively. The results of the work have been very gratifying, the disease having been promptly checked where it has already appeared, and the loss among stock vaccinated before exposure to infection being negligible and in marked contrast to the losses among unprotected animals.

No really satisfactory method of dealing with contagious abortion in cattle, especially among range herds, has been devised.

Swine fever has caused little loss as compared with the previous two-year period. The disease appeared in one or two herds in five counties, but prompt quarantine prevented its general spread, and the thorough application of serum to the sick and exposed animals promptly checked the disease, in some instances without the loss of a single animal.

BIENNIAL REPORT OF THE STATE RABIES COMMISSION, STATE OF NEVADA,
1917 - 1918. Carson City, Nevada: State Printing Office.
1919. Pp. 10.

As this is the first Report issued by the State Rabies Commission or by any body dealing entirely with the matter of rabies and the problems relative thereto in Nevada, it is considered desirable to relate the history of the disease as it affects the State of Nevada. "So far as is known, the far west was free from rabies until 1909, at which time it made its appearance in Southern California, having been introduced directly from the east. Although recognised at that time, no effective steps were taken to eradicate it, and the disease gradually spread, travelling northward through California, and being introduced into Oregon in 1912 by a sheep dog taken across the mountains from Redding, California, to Wallowa County in that State, where this infected dog, in a fight with a coyote, first introduced the disease among wild animals. Later the disease worked south-east, involving Idaho, Nevada, and Utah. Travelling by this devious route, the disease did not reach Nevada until April 1915, although during its passage northward through California it appeared at times very close to the California-Nevada line, but did not cross into and establish itself in the latter State, presumably because at that time the disease was confined to dogs, not involving wild animals, till Oregon was reached as above. Nevada appears to have been invaded by three routes, the first authenticated appearance of rabies being at the northern border of Humboldt County in April 1915, the disease having crossed the State-line at that point from Oregon. Later invasions took place from North-eastern California into Washoe County, and from Idaho into Elko County. Once introduced into the northern part of the State, the disease was spread by means of wild animals and other factors beyond control southward until every county in the State was, to a greater or lesser extent, affected."

The introduction of rabies into Nevada was rendered more serious by the fact that this State, in common with the rest of the inter-

mountain country, harboured a large number of predatory animals—coyotes, mountain-lions, wild cats, etc.—which it was impossible to immediately bring under control, and whose numbers could only be materially reduced by long, extensive, and painstaking effort. The eradication of these animals was first undertaken by co-operation of the Federal Government, the State Board of Sheep Commissioners, and the State Board of Stock Commissioners; but in 1917 a State Rabies Commission was created to continue the work. The work of the Commission is reported as eminently satisfactory in the lessening of the numbers of predatory animals, and the reduction of losses of live stock actually killed directly and dying of rabies as the result of being bitten by infected wild animals.

REVIEWS.

FIFTY YEARS OF A SHOWMAN'S LIFE. By THOMAS F. PLOWMAN. London : John Lane. 1919. Pp. xi + 333. 10s. 6d. nett.

It is scarcely necessary to say that the genial and well-known Secretary of the Bath and West Society is in playful mood when he styles himself "showman": and yet successful "showman" he is, and long has been, in an eminent degree. In relating the experiences that have been his in the span of half a century, he writes pleasantly and discursively on many things—agriculture and agricultural shows mostly, but not by any means exclusively. All his book is interesting, but the following paragraph will have a special appeal for those who knew the late Professor Sir George Brown.

"There was a bad time coming, and one of the first of a succession of misfortunes was the importation from Russia of that terrible disease, the rinderpest, or cattle plague. I have a vivid remembrance of its devastating effect upon agriculture. It meant absolute ruination to hundreds of farmers, and the sufferings of their animals were pitiable in the extreme. It broke out in this country in 1865, and it was not until 1867 that its ravages were stayed. Fully half a million head of cattle died, at a direct cost of at least £5,000,000, apart from the indirect drain upon resources by the general dislocation of all trade in beasts, for markets, fairs, and shows had to be suspended. For many years, and until his death, I enjoyed the friendship of Professor (in later years Sir George) Brown, C.B., chief of the Veterinary Department of the Privy Council, and afterwards of the Board of Agriculture, the one man whose courage did more than anything else to stem the calamitous tide. When called in to advise the Government, he said : 'Give me a free hand and I can stamp it out.' His remedy was 'Slaughter, slaughter, slaughter!' He was given full licence to carry out his specific, and he fulfilled his undertaking. He was one of the most imperturbable of men, the very personification of that coolness and confidence which even an earthquake would never disturb. He had a wonderful store of worldly wisdom, rendered all the more effective when drawn upon by a vein of the driest of dry humour, and an impassiveness of countenance which even the Sphinx might envy. He was for many years, and until his death, the Bath and West Society's veterinary inspector, so that I had full opportunity of knowing and appreciating his striking characteristics. He was

the apostle of prohibition of live imports from foreign countries, and the legislation which has followed upon the representations of himself and other practical authorities has been of incalculable benefit to this country."

But Mr. Plowman is not always in such serious vein. Humorous incident is mingled with historic fact in such proportion as renders his book more attractive than many volumes of reminiscences one has read on the strong recommendation of those who ought to have been good judges.

FATS AND FATTY DEGENERATION. By Dr. MARTIN H. FISCHER, Professor of Physiology in the University of Cincinnati, and Dr. MARIAN O. HOOKER, Instructor in Physiology in the University of Cincinnati. New York: John Wiley & Sons. London: Chapman & Hall. 1917. Pp. ix + 155. 9s. 6d. nett.

When the wave of physical explanation has swept away so much of what was given us as accepted fact when we were students of physiology, it is only to be expected that many pathological theories must perforce give way before the same tide. When the attractive, if possibly somewhat involved, theories of, say, coagulation of the blood, have had to give place to the modern teaching that sees much virtue in surface tension and what not, it is inevitable that the time-honoured explanation of cloudy swelling and fatty degeneration shall be replaced by views based on physical phenomena. How could it be otherwise.

The older pathologists believed that in fatty degeneration fat became visible in the cells because the cells contained more than normal. A simple theory, with all the attractiveness of apparent common sense. Modern research, however, makes the problem much more complicated:

"There is scarcely a tissue or fluid of the body which, even in the poorest states of nutrition, does not contain some fat. But even the smallest amounts of fat thus found exceed the quantities that can be dispersed in permanent form in pure water. The presence of such amounts of fat in these structures, therefore, at once presents a problem identical with that which asks how it is possible, outside the body, to maintain a fat in finely divided form in an aqueous dispersive medium. The presence of any amount of fat in a cell or tissue exceeding a fraction of 1 per cent. is possible only because the tissues contain hydrophilic colloids."

Quantitative chemical analyses have shown that even in the most pronounced phases of fatty degeneration the cells contain no more fat than is commonly found in the same localities in physiological conditions.

"In essence, therefore, 'fatty degeneration' no longer represents a chemical, but a physical problem, which asks how a given quantity

of fat usually so distributed in a cell as to be invisible, becomes re-distributed in such fashion as to be readily visible."

The authors of *Fats and Fatty Degeneration* believe that the production of "fatty degeneration" and "softening" of tissues is a physical process analogous to that taking place in a normal emulsion when it "breaks."

ANIMAL LIFE AND HUMAN PROGRESS. Edited by ARTHUR DENDY, D.Sc., F.R.S., Fellow of King's College and Professor of Zoology in the University of London. London: Constable & Co. 1919. Pp. ix + 227. 10s. 6d. nett.

This volume, we are told by the editor, is the outcome of a course of nine public lectures delivered at King's College, London, in the Spring Term of the Session 1917-18, under the auspices of the Imperial Studies Committee of the University of London. The aim of the lectures was to bring before the public in as convincing a manner as possible the claims of biological science to recognition on terms of equality with other departments of learning. The general trend of the lectures, and the book in which they will appeal to a wider public, could hardly be better indicated than in a characteristic paragraph used by Professor J. Arthur Thompson in illustration of what he calls, with his native faculty for phrase-making, "the web of life."

"The young stages of the trematode worm (*Distomum hepaticum*), which causes the disease of liver-rot in sheep, are harboured inside the little fresh-water snail called *Limnaea truncatula*, common in most pools. The more drainage of pasture land, the fewer pools, the fewer fresh-water snails, the less liver-rot in sheep. And we may make the idea of the web of life picturesque again by noticing that the water wagtail is very fond of the fresh-water snails, so there is a linkage between the preservation of water wagtails—national assets in any case—and the success of sheep-farming."

Dr. R. T. Leiper in his lecture on "Some Inhabitants of Man and their Migrations," incidentally makes out a good case for the value of parasitology as having thrown light on the parasitic conditions in animals and their connection with adult parasites in man. Herein is well illustrated one of the multitudinous points of contact between comparative and human pathology.

Professor Punnett, on the future of the science of breeding, is enthusiastic and decidedly—and warranted—optimistic.

"Since the present century opened no advance in knowledge among the biological sciences has been so momentous as that which has taken place in the province of heredity and variation. . . . I would suggest that the President of the Board of Agriculture keep a watchful eye upon the Universities, and be prepared to purchase these first-rate intellects

whenever they appear. They are not common. Like old masters they come irregularly upon the market. A period of years may go by without one, and then suddenly a single year may throw up several. . . . Given the right men and given the resources I have no fear of the result, even as judged by the purely utilitarian standpoint."

In the ninth lecture, Professor Newstead deals generally with tsetse-flies and colonisation.

A PRACTICAL MEDICAL DICTIONARY OF WORDS USED IN MEDICINE, WITH THEIR DERIVATION AND PRONUNCIATION, INCLUDING DENTAL, VETERINARY, CHEMICAL, BOTANICAL, ELECTRICAL, LIFE INSURANCE, AND OTHER TERMS. By THOMAS LATHROP STEDMAN, A.M., M.D. Fifth, Revised Edition. New York: William Wood & Co. 1919. Pp. xi + 1124.

Of several medical dictionaries that deserve to rank high, "Stedman's" is unquestionably one. That this opinion is held by many is evident from the fact that a fifth edition has been made necessary. As was inevitable, the present edition has been expanded by the recent addition of a large number of new terms to medical terminology, and we are assured by the author that he has added no less than 1500 new titles and sub-titles. On this point we are quite prepared to take his unchecked assertion; and we are further prepared to think that anyone requiring a dictionary of medical terms—and no one nowadays can afford to be without such an aid to writing and interpretation—will have to seek far before he finds a better lexicon of its kind. It will satisfy the veterinary user no less than the medical searcher after definitions.

There is one warning that must be given. The Greek *kappa* is transliterated into the hard *c*, instead of the *k* so commonly used by writers of the present day; with the result that, unless this is kept in mind, the consulter of the dictionary will be led into disappointment if he look for *caryocinesis* and the like under the usual rubric.

Though it does not detract in any way from the usefulness of the book, we have a feeling that it is a mistake to omit the use of Greek letters in giving Greek derivations. Admitted that many of those who consult a dictionary may not have a facility in Greek, it still seems a pity to destroy the unities. There could be no objection to spelling out the Greek derivation in Roman letters, in brackets, for the benefit of those unfamiliar with Greek letters, as an addition to the orthodox spelling.

It must also be kept in mind that in America, even among veterinary anatomists and some practitioners, the Basle Anatomical Nomenclature has found acceptance.

As was natural, we turned to the definition of words that are peculiarly veterinary in application, and were particularly anxious to see what could be said of the terms *pastern* and *stifle*. It was not without disappointment that

pastern was discovered, as usual, to have no derivation assigned to it anterior to the French *pâturon*. *Stifle* again produced disappointment, for no derivation at all is offered. It has always been one of the hopes of the present reviewer that someone sometime will throw light on the obscure name given by veterinary and other writers to a particular region of the limb of the horse. Time is passing, and hope is dying. It will soon be necessary to reconcile oneself to the thought that the derivation of the term is one of the world's great and insoluble mysteries.

Provided as it is with a limp cover and a thumb-index, and being devoid of the drawback of unwieldiness and undue weight, the present edition of *Stedman's Medical Dictionary* will keep the place won by its predecessors among those books of reference that must lie within easy reach of the writer's table and the reader's chair.

NOTES ON BOOKS.

THE STORY OF ROMSEY REMOUNT dépôt. By Colonel Sir H. M. JESSEL, Bart., C.M.G., M.P. London: The Abbey Press, Westminster. 1919. Pp. 117. 1s.

Romsey Remount Dépôt was the first dépôt built expressly for an establishment of military personnel. One of the main ideas prevalent at the beginning of the war was that it was necessary to take strict precautions to secure isolation in order to prevent the spread of infectious diseases; but experience of the new model at Romsey has proved that, where proper veterinary precautions are taken, there is no more danger of disease spreading in a remount dépôt built with the squadrons comparatively close together than there is in the very scattered dépôts.

Statistics on veterinary, financial, and personal matters are here collected and summarised in the hope that the results embodied in the review may prove of use to a future generation.

HORSE MANAGEMENT IN THE FIELD AT HOME AND ABROAD. By Lieut.-Colonel E. D. MILLER, D.S.O. London: Gale & Polden. 1919. Pp. vii + 124. 1s. 6d. nett.

A COURSE OF TWELVE LECTURES ON THE CARE OF HORSES., By Lieut.-Colonel G. L. HOLDSWORTH. London: Gale & Polden. 1919. Pp. 48. 2s. nett.

LIFE AND ITS MAINTENANCE: A SYMPOSIUM ON BIOLOGICAL PROBLEMS OF THE DAY. London: Blackie & Son. 1919. Pp. viii + 297. 5s. nett.

Fifteen lectures delivered at University College, London, during the first half of 1918. One of the lectures, by Dr. R. C. M'Lean, deals with the anaerobic treatment of wounds.

THE PITUITARY: A STUDY OF THE MORPHOLOGY, PHYSIOLOGY, PATHOLOGY, AND SURGICAL TREATMENT OF THE PITUITARY, TOGETHER WITH AN ACCOUNT OF THE THERAPEUTIC USES OF THE EXTRACTS MADE FROM THIS ORGAN. By W. BLAIR BELL. London: Baillière, Tindall & Cox. 1919. Pp. xx + 348. 30s. nett.

A TEXT-BOOK OF PHYSIOLOGY. By Drs. M. FLACK and L. HILL. London : E. Arnold. 1919. Pp. viii + 800. 25s. nett.

PRACTICAL PHYSIOLOGICAL CHEMISTRY. By PHILLIP B. HAWK, M.S., Ph.D., Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadelphia. Sixth Edition, Revised and Enlarged. London : J. & A. Churchill. 1919. Pp. xiv + 661. 21s. nett.

MAMMALIAN PHYSIOLOGY: A COURSE OF PRACTICAL EXERCISES. By C. S. SHERRINGTON, F.R.S., Waynflete Professor of Physiology in the University of Oxford. Oxford : The Clarendon Press. 1919. Pp. xii + 156. 12s. 6d. nett.

PRACTICAL PHYSIOLOGICAL CHEMISTRY. By SYDNEY W. COLE. Fifth Edition, Revised and Enlarged. Cambridge : Heffer & Sons. 1919. Pp. xvi + 401. 15s. nett.

This represents the course taken by the medical students at Cambridge.

THE NEW PHYSIOLOGY AND OTHER ADDRESSES. By J. S. HALDANE, M.D., LL.D., F.R.S. London : Griffin & Co. 1919. Pp. vii + 156. 8s. 6d. nett.

Contains six addresses dealing mainly with the relation of biology to other departments of knowledge.

THE ELEMENTARY NERVOUS SYSTEM. By G. H. PARKER, Professor of Zoology, Harvard University. Philadelphia and London : J. B. Lippincott Co. 1919. Pp. 229. \$2.50 nett.

THE PHYSICAL CHEMISTRY OF THE PROTEINS. By T. BRAILSFORD ROBERTSON, Professor of Biochemistry and Pharmacology, University of California. London : Longmans, Green & Co. 1919. Pp. xv + 483. 25s. nett.

PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE. By J. J. R. MACLEOD, M.B., Professor of Physiology, University of Toronto, assisted by ROY G. PEARCE, B.A., M.D., and others. London : Henry Kimpton. 1918. Pp. 903. 37s. 6d. nett.

ESSENTIALS OF MEDICAL ELECTRICITY. By ELKIN P. CUMBERBATCH, M.A., B.M., etc., St. Bartholomew's Hospital. Fourth Edition. London : Henry Kimpton. 1919. Pp. 368. 7s. 6d. nett.

We gave a note on the third edition of this book in our issue of February 1917. The current edition has been revised and partly re-written.

CLINICAL MICROSCOPY AND CHEMISTRY. By F. A. M'JUNKIN, M.A., M.D., Professor of Pathology, Marquette University School of Medicine. London : W. B. Saunders Co. 1919. Pp. 470. 16s. nett.

INORGANIC CHEMISTRY. By Professor JAMES WALKER. Eleventh Edition, Revised and Enlarged. London : G. Bell & Sons. 1919. Pp. viii + 326. 5s. nett.

BOTANY OF THE LIVING PLANT. By Professor F. O. BOWER, University of Glasgow. London : Macmillan & Co. 1919. Pp. x + 580. 25s. nett.

THE MODERN MILK PROBLEM IN SANITATION, ECONOMICS, AND AGRICULTURE. By J. SCOTT MACNUTT. New York : The Macmillan Co. 1919. Pp. xi + 258. 10s. 6d. nett.

FOOD CONTROL MISMANAGEMENT: THE TRAGEDY OF MILK PRODUCTION. By Professor R. WALLACE. Edinburgh : Oliver & Boyd. 1919. Pp. 40. 6d.

LEHRBUCH DER ALLGEMEINEN PATHOLOGIE FÜR TIERÄRZTE UND STUDIERENDE DER TIERMEDIZIN. Von TH. KITT. 4te Auflage. Stuttgart : F. Enke. 1918. 593 Seiten. 32 M.

HANDLEXIKON DER TIERÄRZTLICHEN PRAXIS. Von Professor Dr. GUSTAV UEBELE. 2te Auflage. Ulm : J. Ebners. 1918. 16 M.

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[A note on a paper under this heading does not preclude a fuller abstract in a later issue.]

ANATOMY

(Including Embryology and Histology).

BOURDELLE, E. "Innervation of the Suspensory Ligament (Interosseous Muscle) and Neurectomy of the Deep Branch of the Lateral Volar (Metacarpal) Nerve" (L'innervation du ligament suspenseur du boulet et la névrotomie de la branche palmaire profonde chez le cheval). *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 141-147. 2 Figures.

BRESSOU, C. "Presence of an Anterior Jugular Vein in the Horse, accompanied by a Jugulo-Carotid Aneurismal Anastomosis" (Présence d'une jugulaire antérieure chez le cheval, accompagnée d'une anastomose anévrismale jugulo-carotidienne). *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 147-154. 2 Figures.

BRUNI, A. C. "The Basal Cartilages of the Nose and the Intermaxillary (Incisive) Bone of Domestic Equines" (Cartilagini del naso ed osso intermascellare negli equini domestici). *Il Nuovo Ercolani.* Vol. XXIV., Nos. 7-8. 15th-30th April 1919. Pp. 81-88. 1 Plate (4 Figures).

DECHAMBRE. "Time of Eruption of the Teeth of Argentine Shorthorns" (L'âge des bovins argentins). *Rec. Méd. Vét.* Vol. XCV., No. 2. 30th January 1919. *Bull. Soc. Centr. Méd. Vét.* 9th January 1919. Pp. 35-36.

A short abstract of the conclusions arrived at by G. Reibel after the examination of the dentition of 2169 shorthorns of precisely known age. The abstract is of a brochure entitled *Edad de los bovinos shorthorn argentinos de 12 a 44 meses.*

HOPKINS, G. S. "The Paranasal or Facial Sinuses of Sheep." *Report N. Y. State Vet. Coll., 1917-18.* 1919. Pp. 119-121. 3 Figures.

In addition to the frontal, maxillary, and palatine sinuses, as usually described in sheep, the author gives a brief account of two other cavities, one in the dorsal turbinate and the other in the ethmoid.

SUNDERVILLE, E. "The Anatomy of the Digestive Tract of Sheep." *Report N. Y. State Vet. Coll., 1917-18.* 1919. Pp. 122-127.

ZANNINI, P. "The Constant Existence and Morphological Significance of a Tendinous Lamina Connected with the Tendons of the Extensors of the Phalanges in the Ass" (Attorno alla constante esistenza e al significato morfologico di una lamina-tendinosa annessa al tendine del muscolo epicondilo prefalangeo nell' asino). *La Clinica Vet.* Vol. XLII., No. 5. 15th March 1919. Pp. 138-149. 1 Figure.

CLINICAL.

AUGSBURGER, E. "Abomasal Fistula in a Cow" (Labmagenfistel bei einer Kuh). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 3. March 1919. Pp. 138-141.

BÉDEL. "Prolapse of the Uterine Cornua without Inversion. Amputation of the Uterus. Recovery" (Chute des cornes utérines sans renversement de celles-ci à la suite d'un vêlage rendu dystocique par un cas de "spina bifida" du fœtus. Amputation de l'utérus. Guérison). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 53-54.

The case occurred in a cow after a difficult parturition. The cornua were involved in a large tear in the body of the uterus.

— "A Tumour of 140 Kilogrammes in the Abdomen of a Horse" (Une tumeur de 140 kilogrammes dans l'abdomen d'un cheval). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. P. 61.

The tumour was adherent to one kidney and parts of the omentum. A microscopic examination was not made.

BOUIN. "Large Aneurysm of the Cranial (Anterior) Mesenteric Artery" (Volumineux anévrisme de l'artère grande mésentérique). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 20th February 1919. Pp. 93-95. 1 Figure.

The case occurred in a very old Moroccan mule. The aneurysm was about 50 cm. in diameter, and had an irregular surface. Its wall was fibrous

and lardaceous, dense, and varied from 3 to 10 cm. in thickness. It had a short neck, several centimetres in length, which placed it, by means of a small orifice, in communication with the mesenteric artery.

BÜRKI, F. "Treatment of Tetanus with Magnesium Sulphate" (*Beitrag zur Tetanus-Behandlung mit Magnesium sulfuricum*). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 3. March 1919. Pp. 141-145.

An account of a case of tetanus in a horse treated with subcutaneous injections of magnesium sulphate. The case ended fatally, but, though no definite conclusions can be arrived at, the author is apparently of opinion that this method of treatment holds out greater hopes than does serum-therapy.

CINOTTI, F. "Fracture of the Greater (Lateral) Tubercle of the Humerus: Tenotomy of the Infraspinous Muscle" (*Fractura del troquiter: Tenotomia del retro espinoso*). *Revista Soc. Med. Vet.* Vol. IV., No. 1. January 1919. Pp. 3-7.

Already abstracted from another source (*Review*, 1919, III. 154).

EVE, H. B. "Split Aitches in the Cow." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. Pp. 107-108.

Fracture of the symphysis of the pubis.

— "Yohimbine in the Treatment of Incontinence of Urine in the Dog." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. Pp. 108-109.

A case in a fox terrier, diagnosed as paralysis of the bladder, was treated successfully by the administration of aphrodine.

— "Alopecia in the Dog, Complicated by Carcinoma." *Vet. Journ.* Vol. LXXV., No. 4. April 1919. Pp. 141-143. 1 Figure.

A fox terrier, about nine years old, had been treated for about two years for skin disease, without success. The animal turned vicious, became paralysed, had convulsive fits, and was consequently destroyed. Whether the skin disease was dry eczema, follicular mange, or alopecia was doubtful. Post-mortem examination revealed carcinoma (10½ ozs.) of the bladder and of the testes.

FITCH, C. P., BOYD, W. L., and BILLINGS, W. A. "Catarrhal Enteritis Complicated by Sarcoma of the Spinal Meninges." *Cornell Veterinarian*. Vol. VIII., No. 4. October 1918. Pp. 296-298.

The case (in a pure-bred Guernsey cow) began as a typical case of catarrhal enteritis. A slight wavering gait rapidly developed into a double posterior paralysis. The duration of the disease was approximately two weeks. A comatose condition supervened, and the animal was destroyed.

"In the sacral region of the spinal meninges on the inner side, pressing on but not involving the cord, was a small yellowish growth, 2 cm. long, 1 cm. wide, and 8 mm. thick. This growth involved (surrounded) both the spinal nerves coming off from this location. Microscopical examination of this growth showed it to be a small round-celled sarcoma."

GOLDBERG, S. A. "Nephrolithiasis in a Dog." *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 121-123. 2 Figures.

The pelvis of the left kidney of an aged female bloodhound contained a triangular whitish calculus, 5 cm. long, 4 cm. along the base, and 2·5 cm. thick. The secondary lesions were acute purulent pyelitis, cystitis, and urethritis. The immediate cause of death was apparently toxæmia or bacteræmia.

— "Complete Prolapse of the Uterus of a Cow." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 204-206. 1 Figure.

In a three-year-old Jersey cow, "the uterus was prolapsed completely and one horn was nearly entirely everted." There was strangulated hernia of part of the small intestine into the everted uterine horn.

HUDSON, R. "Rupture of the Aorta." *Vet. Journ.* Vol. LXXV., No. 4 April 1919. P. 145. 1 Figure.

A thoroughbred hunter died suddenly. A rupture of the aorta was found close to the semilunar valves.

— "Vascular Growths on Sheep." *Vet. Journ.* Vol. LXXV., No. 4. April 1919. P. 146.

On the upper lip and nostril of four Lincoln ewes there were soft vascular growths that bled freely on being touched, were about half an inch to an inch in height and from a shilling to a crown piece in width. The growths were scraped and dressed with a solution (1 in 40) of formalin. Healing was almost complete in fourteen days.

— "Rupture of the Womb, with Fœtus in the Abdominal Cavity." *Vet. Journ.* Vol. LXXV., No. 4. April 1919. Pp. 146-147.

"The fact that the cow was ill some days before calving, and the undilated os, point to the conclusion that rupture of the uterus took place before the act of parturition."

MAYALL, G. "Conjunctivitis and Collyria." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. Pp. 105-187.

Discusses six cases of conjunctivitis in dogs.

MILKS, H. J. "Multiple Carcinoma." *Cornell Veterinarian.* Vol. VIII., No. 4. October 1918. Pp. 299-300.

In an aged male fox terrier, carcinomas were found in the subcutaneous tissue, peritoneum, spleen, liver, kidneys, and in the muscles.

MORGAN, E. "Tumour in the Duodenum of a Six-Year-Old Cow." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. Pp. 103-105.

Periods of colic were succeeded by intervals during which the cow assumed a strange position. "She had the fore legs extended forwards, and lay herself flat on the floor of the abdominal wall, very similar to the mode of resting adopted by a ewe which is heavy in lamb and has twins in the uterus, or similar to the posture of a hare when she squats in her form so as to evade the eyes of her pursuer." The case ended fatally. There was "a hard, fibrous growth inside the lumen of the duodenum, and at one place, about 4 ins. from the pyloric opening of the stomach, was completely obstructing the passage."

ORENSANZ, J. "A Case of Anthrax in a Mule. Recovery" (Un caso de fiebre carbuncosa en un mulo, seguido de curacion). *Rerista Hig. y Sanidad Pecuarias.* Vol. IX., No. 3. March 1919. Pp. 123-124.

PERRONCITO, E. "Melanotic Tumour in the Ox. Pulmonary Melanosis in the Ox and Goat" (Tumeur mélanique du bœuf. Mélanose pulmonaire du bœuf et de la chèvre). *Rec. Méd. l'ét.* Vol. XCV., No. 6. 30th March 1919. *Bull. Soc. Centr. Méd. Vét.* 20th March 1919. P. 118.

The skin and muscles of an ox were infiltrated with pigment and there were deposits of pigment in the heart and lungs. The epicardium and myocardium, in particular, were diffusely coloured black, without the presence of tumours in the proper sense of the word. Small melanotic tumours were present in the skeletal muscles.

The dura mater, arachnoid, and pia mater of a calf were strongly coloured black or dark grey by a granular pigment.

No note is given of the case in the goat.

PIOT BEY. "Perforating Ulcer of the Urinary Bladder of a Calf, possibly Due to Bilharziosis" (Perforation ulcéruse de la vessie attribuée à la bilharziote chez un veau). *Rec. Méd. Vét.* Vol. XCIV., No. 23. 15th December 1918. Pp. 631-632.

Just below the centre of the vertex of the urinary bladder of a yearling Egyptian calf there were two linear perforations, situated side by side and parallel to each other. The mucous membrane of the bladder was irritated, villous, and thickened. The mucous membrane of the small intestine was congested in patches, and there were several ulcers of the size of sixpence. Though no eggs could be found in preparations (scrapings and sections)

the author evidently suspects that the lesions in the bladder were due to *Bilharzia*.

SCASSO, R., and CHARLES, E. "A Case of Osteomalacia in a Pig" (Un caso de alteración constitucional de tipo osteomaláxico en el cerdo). *Revista Zootecnica*. Vol. VI., No. 65. February 1919. Pp. 348-350.

SPAULDING, R. H. "Elephantiasis Telangiectodes." *Cornell Veterinarian*. Vol. VIII., No. 4. October 1918. Pp. 300-301.

In a male fox terrier about six years old a swelling appeared on the left side of the neck just anterior to the scapula. "This is an exceedingly rare condition. . . . In human practice it is occasionally seen and it was from this source that we were able to make a diagnosis."

DIETETICS.

"An Experiment in the Rearing of Calves on Whey and Meals." *Journ. Board Agric.* Vol. XXVI., No. 1. April 1919. Pp. 39-51. 4 Plates.

ARMSBY, H. P., and FRIES, J. A. "Net Energy Values and Starch Values." *Journ. Agric. Sci.* Vol. IX., No. 2. April 1919. Pp. 182-187.

BRUNNICH, J. C. "Calf Foods." *Queensland Agric. Journ.* Vol. IX., No. 3. March 1919. Pp. 105-111. 2 Plates (4 Figures).

BUCKNER, G. D., NOLLAU, E. H., WILKINS, R. H., and KASTLE, J. H. "Effect of Certain Grain Rations on the Growth of the White Leghorn Chick." *Journ. Agric. Res.* Vol. XVI., No. 12. 24th March 1919. Pp. 305-312. 1 Plate (3 Figures), 3 Tables.

FURLONG, J. R. "The Rancidity of Palm Kernel and Other Feeding Cakes." *Journ. Agric. Sci.* Vol. IX., No. 2. April 1919. Pp. 137-142.

GIULIANI, R. "The More Rational Methods of Producing Ensilage" (I piu razionali sistemi di insilamento dei foraggi). *La Clinica Vet.* Vol. XLII., No. 4. 28th February 1919. Pp. 97-108.

GORINI, C. "Silage" (Studi sui silo lattici in base alla fisiologia microbica). *La Clinica Vet.* Vol. XLII., No. 6. 31st March 1919. Pp. 171-185.

LÉPINAY, L. "Seaweed as Food for Horses" (Les algues dans l'alimentation des chevaux). *Rev. Path. Comp.* Vol. XIX., No. 154. March 1919. Pp. 11 (71)-14 (74).

MAIGNON, F. "The Mechanism of the Action of Fats in the Utilisation and Assimilation of Albuminoids" (*Étude du mécanisme de l'action des graisses dans l'utilisation et l'assimilation des albuminoïdes*). *C. R. Acad. Sci.* Vol. CLXVIII., No. 12. 24th March 1919. Pp. 626-629.

The better utilisation of albumen in the presence of fats is due to the reduction to a minimum of unutilisable loss.

MARCENAC. "Fractional Feeding of Horses" (*Le régime des repas fractionnés chez le cheval de guerre*). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 328. April 1919. Pp. 181-185.

MURRAY, J. A. "Meat Production." *Journ. Agric. Sci.* Vol. IX., No. 2. April 1919. Pp. 174-181. 1 Chart.

NEIDIG, R. E., and IDDINGS, E. J. "Quantity and Composition of Ewes' Milk; Its Relation to the Growth of Lambs." *Journ. Agric. Res.* Vol. XVII., No. 1. 15th April 1919. Pp. 19-32. 6 Tables.

PIROCCINI, A. "Silk-worm Chrysalis Meal as a Food for Milk Cows" (*La farina di crisalidi dei bachi da seta nell'alimentazione delle vacche da latte*). *La Clinica Vet.* Vol. XLII., Nos. 9-10. 15th-31st May 1919. Pp. 271-292.

SATRE, A. "The Addition of Nettles to the Forage Ration of Horses" (*Alimentation des chevaux d'une formation sanitaire pendant les dernières années de la campagne. Addition de l'ortie à la ration de fourrage*). *Rev. Path. Comp.* Vol. XIX., No. 153. February 1919. Pp. 22 (52)-23 (53).

The writer of this note relates his experience during the last years of the war, when there was difficulty in getting full supplies of forage. After slight drying or short maceration, the young dioecious nettle loses almost entirely the burning juice (formic aldehyde), to which it owes its unpleasantness, and serves as a useful complement to the ration of horses and mules. Dried and chopped, the young nettle increases the appetite of horses, keeps them in a good state of health, and produces a fine coat.

TORREY, J. C. "The Regulation of the Intestinal Flora of Dogs through Diet." *Journ. Med. Res.* Vol. XXXIX., No. 3. January 1919. Pp. 415-447. 9 Tables.

GENERAL.

CARLE, G. "Stock Breeding in Madagascar." *Internat. Rev. Sci. and Practice Agric.* Vol. X., No. 1. January 1919. Pp. 1-11.

DECHAMBRE. "The Registration of Bulls" (La réglementation de la monte des taureaux). *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 249-258.

The author regards the regulation of service by bulls to be indispensable in the reconstruction of French herds.

DERRÉ, J. "The Cattle and Sheep of French West Africa" (Le bétail de l'Afrique occidentale français: Utilisation commerciale et rendement). *Rec. Méd. Vét.* Vol. XCIV., No. 19. 15th October 1918. Pp. 513-523. *Ibid.* No. 21. 15th November 1918. Pp. 587-594. *Ibid.* No. 23. 15th December 1918. Pp. 633-645. 13 Figures.

FAYET. "Instruction in Colonial Veterinary Medicine" (Enseignement de la médecine vétérinaire coloniale). *Rev. Path. Comp.* Vol. XIX., No. 154. March 1919. Pp. 17 (77)-19 (79).

Suggests the institution of a school of colonial veterinary medicine.

GOEBEL, C. H. "The Serum Producer and the Veterinarian." *Amer. Journ. Vet. Med.* Vol. XIV., No. 4. April 1919. Pp. 167-168.

"The manufacture of antihog-cholera serum and virus has reached such magnitude to-day that it takes its place and is classified as one of the leading commercial industries throughout the United States." A closer relationship between the producer and the veterinary surgeon is necessary.

ROBERTSON, G. S. "The Possibilities of the British Friesian Cow for Dairy Purposes." *Journ. Board Agric.* Vol. XXVI., No. 2. May 1919. Pp. 131-146. 2 Plates (4 Figures), 9 Tables, 1 Graph.

SAIZ, L. "The Commercial and Alimentary Value of Milk" (La leche. Su valor comercial y alimenticio). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 3. March 1919. Pp. 101-106.

States the monthly variation in the commercial and alimentary value of milk.

"Summary Report on the Army Veterinary Service for the Period from 4th August 1914 to 31st December 1918" (Summarischer Bericht betreffend de Veterinardienst der Armee während der Grenzbesetzung vom 4 August 1914 bis 31 Dezember 1918). *Schweizer Arch. f. Tierheilk.* Vol. LXI, No. 4. April 1919. Pp. 155-160.

GENETICS AND HEREDITY.

EWART, J. COSSAR. "The Intercrossing of Sheep and the Evolution of New Varieties of Wool." *Scottish Journ. Agric.* Vol. II., No. 2. April 1919. Pp. 159-169. 5 Plates (12 Figures).

HISTORICAL.

MOLINÉRY, R. "The Treatment of Wounds of Horses at Sulphur Springs" (Le traitement des chevaux blessés aux eaux sulfurées) *Rev. Path. Comp.* Vol. XIX., No. 153. February 1919. P. 9 (39).

An historical note on some sulphur springs in France used for horses.

HYGIENE AND PREVENTIVE MEDICINE.

BRUCE, J. L. "Sheep-Dipping Points." *N. Z. Journ. Agric.* Vol. XVIII., No. 2. February 1919. P. 102.

"Dip at least twice a year. . . . Do not dip ewes immediately before putting to the ram. Several weeks should intervene. Dip when the sheep are in a normal condition, the wool dry, and the weather mild. Dip rams early. On no account should they be dipped after they are in condition for the season."

CARPENTIER. "Method of Preserving Meat as Practised at Fez" (Note sur un procédé indigène de conservation de la viande, à Fez). *Rec. Méd. Vét.* Vol. XCV., No. 5. 15th March 1919. Pp. 149-156.

The indigenous Moroccan method of preserving meat consists in sterilisation by salting, desiccation, and heat; subsequent contamination being prevented by smearing with fat.

DE CASTRO Y VALERO, J., and CAMPUZANO E IBANEZ, T. "Biological Methods for the Specific Differentiation of Flesh and Milk" (Sobre los procedimientos biológicos de diferenciación específica de carnes y de leches). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 5. May 1919. Pp. 244-259.

Precipitation is a good method for the differentiation of animal albumins, particularly of flesh. Anaphylaxis is a more practicable method, even where the albumen is in small quantities, and is particularly good in the case of milk. Fixation of the complement is applicable in fresh meat or meat

preserved by desiccation. It cannot be used if the meat has been preserved by heat or the application of antiseptics, or when there are incipient changes in the meat. If possible, all three methods should be used.

FANTUS, B. "Chlorinated Lime and Halazone in the Disinfection of Drinking Water." *Journ. Inf. Dis.* Vol. XXIV., No. 3. March 1919. Pp. 191-203. 4 Charts.

"Chlorinated lime is a more efficient disinfectant than halazone, compared on the basis of active chlorin. It is, of course, also a great deal cheaper. Hence there is no reason for employing halazone in water disinfection, excepting when its superior tablet-making qualities render its use advantageous. Halazone is the better agent for the preparation of water disinfecting tablets. Its action is, however, a rather slow one."

M'CARTNEY, J. "Some of the Present Day Problems in Milk Sanitation." *Cornell Veterinarian.* Vol. VIII., No. 4. October 1918. Pp. 282-286.

INFECTIOUS DISEASES.

BÉDEL. "A Bovine Disease of Indeterminate Nature" (Aphticelle des bovidés). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 325. January 1919. Pp. 12-17.

— "An Erosive Stomatitis, of Indeterminate Nature, in Horses and Mules" (Note sur une stomatite érosive, de nature indéterminée, des chevaux et des mulots). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 55-56.

A stomatitis of an erosive character, affecting American and French horses as well as mules, can be transmitted from horse to horse and from mule to mule. In the mule it is sometimes accompanied by a discharging eruption in the hollow of the pastern; and the lesions of the mouth, in experimental inoculation, are preceded by vesicles that may pass unobserved because of the rapidity with which they rupture. It is possible that the disease may be a variety of equine variola, differing from the type in the absence of pustules or umbilicated vesicles.

"Attempts at the Attenuation of the Virus of 'Foot-and-Mouth' Disease" (Sur quelques essais d'atténuation du virus aphthœux). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 56-58.

BÉDEL. "Reaction to Mallein in Cases of 'Strangles'" (Note sur la réaction à la malleine dans le cas d'anasarque). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 58.

— "The Period of Incubation in Black Quarter" (Sur la durée du charbon symptomatique). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 58-59.

The period of incubation is not more than five days.

BÉLIN. "Treatment of Contagious Lymphangites of the Horse by Pyotherapy" (Traitement des lymphangites contagieuses du cheval par la pyothérapie). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 20th February 1919. Pp. 73-93.

— "Oxidotherapy" (À propos de l'oxydothérapie). *Rev. Path. Comp.* Vol. XIX., No. 154. March 1919. Pp. 19 (79)-21 (81).

BEVAN, LL. E. W. "Contagious Abortion in Cattle in Rhodesia." *Rhodesia Agric. Journ.* Vol. XVI., No. 2. April 1919. Pp. 116-122.

Reproduced from *Journ. Comp. Path. and Therap.*, 1915, xxviii.

BIRCH, R. R. "Observations in Regard to Immunizing Young Pigs." *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 75-92. 12 Charts, 2 Tables.

BOQUET, A., and NÈGRE, L. "The Polymorphism of the Cryptococcus of Rivolta" (Polymorphisme et déterminisme morphogénique du cryptocoque de Rivolta). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 3. March 1919. Pp. 184-190.

CABAYÉ, COLLE, and LAMARQUE. "Glanders in the Mule" (Contribution à l'étude clinique de la morve chez le mullet). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 326. February 1919. Pp. 65-70.

CARPENTER, C. M. "Handling an Outbreak of Calf Scours and Pneumonia." *Report N. Y. State Vet. Coll., 1917-18.* 1919. Pp. 109-118. 2 Tables.

The author concludes that there is a marked rise of temperature before other symptoms of scours and pneumonia are seen, that serum (produced by immunisation to the colon group of bacilli) is valuable in acute cases of pneumonia if large enough doses are used, that the herd-autogenous bacterins were very efficient in chronic cases of scours and pneumonia, that very little milk is required to keep calves thriving and well, and that it is highly important where calves are badly infected that the milk ration should be very low.

CHÉNIER, G. "Epizootic Lymphangitis" (L'origine du dossier de la lymphangite épizootique). *Rec. Méd. Vét.* Vol. XCV., No. 7 15th April 1919. Pp. 198-204.

COLOMO, V. "Malta Fever" (La Melitococcia). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 5. May 1919. Pp. 237-243.

Malta fever is a goat infection transmitted to man principally by the ingestion of raw milk.

CROSS, H. E. "Are Camels Susceptible to Blackquarter, Hæmorrhagic Septicæmia and Rinderpest?" *Bull. No. 80.* Agric. Res. Inst., Pusa. 1918. Pp. 17. 16 Charts, 1 Plate.

"Camels are as susceptible to blackquarter as cattle. . . . Camels are not very susceptible to hæmorrhagic septicæmia. . . . Camels develop severe lesions of rinderpest and are more susceptible than some cattle to rinderpest."

CROVERI, P. "Rinderpest" (Sulla recettività alla vaccinazione antipestosa dei vitelli nati da mare immune verso la peste bovina. Esperimenti siero-vaccinazione antipestosa (methode Kolle e Turner) in vitelli lattanti e dopo la slattamento). *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 65-71. *Il Nuovo Ercolani.* Vol. XXIV., No. 9. 15th May 1919. Pp. 101-107.

CURASSON, G. "Jhooling in the Dromedary" (Une maladie du dromadaire analogue au farcin du bœuf). *Rec. Méd. Vét.* Vol. XCIV., No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 5th December 1918. Pp. 491-496.

The disease is apparently the same as jhooling in camels, as described by Cross (see this *Review*, 1918, II. 307-308). Curasson reports that he has isolated and cultivated an organism closely related to the streptothrixes. He claims positive inoculation results with the dromedary, sheep, and rabbit; negative with the ox and monkey. His treatment consists in opening the lesions and dressing them with 4 to 5 per cent. solution of sulphate of copper.

— "The Diagnosis of Bovine Peripneumonia" (Le diagnostic de la péripleunomie bovine dans la brousse). *Rec. Méd. Vét.* Vol. XCIV., No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 19th December 1918. Pp. 506-508.

In semi-wild animals, where more precise methods are impracticable, Curasson makes his diagnosis by observation of the cough.

DELGADO, A. "Swine Fever. Filterable Virus and *Bacillus suisepicus* as Etiological Factors in Infectious Pneumo-enteritis of the Pig" (Contribución al estudio de las epizootias suideas. El virus filtrable y el *Bacillus suisepicus* como agentes etiológicos en la pneumo-enteritis infecciosa del cerdo). *Revista Hig. y Sanidad Pecuarias*. Vol. IX., No. 4. April 1919. Pp. 165-172.

DEVINE, J. F. "Contagious Abortion." *Vet. News.* Vol. XVI., No. 802. 17th May 1919. Pp. 160-162. *Ibid.* No. 803. 24th May 1919. Pp. 168-170. *Ibid.* No. 804. 31st May 1919. Pp. 177-178.

A reprint from *Amer. Journ. Vet. Med.*, where it appeared under the heading of "Retained Placenta."

DORSET, M., M'BRYDE, C. N., NILES, W. B., and RIETZ, J. H. "Studies on the Hyperimmunization of Hogs against Hog Cholera." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 259-280. 10 Tables. *Amer. Journ. Vet. Med.* Vol. XIV., No. 6. June 1919. Pp. 272-274.

EDMONDS, C. R. "Anthrax." *Rhodesia Agric. Journ.* Vol. XVI., No. 1., February 1919. Pp. 29-32.

General information for the instruction of the stock owner.

FINZI, G. "'Foot-and-Mouth' Disease and Immunity" (Afta epizootica e immunita). *Il Nuovo Ercolani.* Vol. XXIV., No. 10. 31st May 1919. Pp. 113-115.

An attack of "foot-and-mouth" disease does not confer immunity. Possibly, in animals recovered from the disease there is a greater disposition to contract the disease than there is in other bovines. In the author's clinical experience, he has seen cases of reinfection five, four, three, and two months after a primary attack.

FITCH, C. P. "Necrobacillosis." *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 93-103.

Necrobacillosis is in no sense a new disease, but it is becoming more prevalent in certain parts of the United States. It frequently occurs along with swine fever in the same animal, and these cases of mixed infection require great care in diagnosis. If the necrotic lesions are not too extensive or the herd too extensively infected, it may be wise to use antihog-cholera serum. Some types of the disease do not lend themselves to treatment, but the keynote in control is prevention based on the proper disposal of manure. To the four types of the disease given by Graham (see this *Review*, 1919, III. 34), the author adds a fifth, namely necrotic pneumonia.

FITCH, C. P., BOYD, W. L., and BILLINGS, W. A. "Preliminary Report on the Value of the Blood Tests in the Control of Contagious Abortion." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 681-702.

FLORES, C. F. "A Contribution to the Study of Epizootic Encephalo-Meningitis of the Horse" (Contribución al estudio de la encéfalo mengitie epizoótica del caballo (Balordone abdominal)). *Revista Soc. Med. Vet.* Buenos Aires. Vol. IV., No. 2. February 1919. Pp. 35-43.

FREY, J. J. "Problems in Anthrax Control." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 2. May 1919. Pp. 192-198.

GILTNER, W. "Suggestions for Legal and Regulatory Measures against Bovine Infectious Abortion." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 702-714.

GORCE. "Epizootic Lymphangitis" (Farcin d'Afrique. Lymphangite épizootique. Coup d'œil rétrospectif). *Rec. Méd. Vet.* Vol. XCV., No. 7. 15th April 1919. Pp. 204-206. (Police sanitaire de la lymphangite épizootique.) *Ibid.* Pp. 206-207.

HOSKINS, H. P. "The Present Status of Specific Treatment for Contagious Abortion." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 727-737.

— "An outbreak of Hemorrhagic Septicemia among Sheep." *Amer. Journ. Vet. Med.* Vol. XIV., No. 5. May 1919. Pp. 218-221.

Either hæmorrhagic septicæmia in sheep is on the increase or its exact nature has not been previously recognised. "In the outbreak here reported, wherein the disease made its appearance among a band of nine thousand sheep, shipped from Montana to Michigan, via Chicago, and distributed to thirty farms on arrival, every one of the thirty flocks suffered losses, although the mortality varied widely on the different farms." The similarity between this disease and the form of hæmorrhagic septicæmia in cattle generally known as "stockyards pneumonia" is pointed out.

JOHNSON, G. A. "Secondary Invaders and their Relation to the Filtrable Virus." *Amer. Journ. Vet. Med.* Vol. XIV., No. 5 May 1919. Pp. 214-218.

JORGENSEN, G. E. "Hemorrhagic Septicemia." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 738-740.

In the experience of the author of this note, curative treatment has been waste of time. "Prophylactic treatment, however, has been followed by

very successful and encouraging results. This is accomplished by subcutaneous injections of a sterile suspension of the killed organisms, together with their cultural products A single treatment usually is sufficient." The author has, however, met with outbreaks in several herds where a second treatment was necessary.

KNALL, G. A. "Some Recent Experience with Hemorrhagic Septicemia in Cattle." *Cornell Veterinarian*. Vol. IX., No. 1. January 1919. Pp. 41-44.

"This paper is really a case report upon some recent experiences."

M'FADYEAN, J., and EDWARDS, J. T. "Observations with Regard to the Etiology of Joint-Ill in Foals." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 1. March 1919. Pp. 42-71.

M'FARLAND, C. M., and PROESCHER, F. "Bacterial Infections in Swine and their Relation to Hog-Cholera." *Amer. Journ. Vet. Med.* Vol. XIV., No. 4. April 1919. Pp. 168-171.

"As a result of a large number of autopsies and the examination of numerous field specimens obtained from sick swine, the following micro-organisms have been consistently isolated:—(1) *B. suisepcticus*; (2) *B. suisepstifer*; (3) *B. paratyphosus A* and *B*; (4) *B. enteritidis*; (5) *B. pyocyanus*; (6) *B. coli*; (7) the microcococcus of hog-cholera [as isolated by Proescher and Seil (see this *Review*, 1917, I, 383)] Hog-cholera is nearly always accompanied by secondary bacterial infections, which have a tendency to increase the death-rate by producing pneumonia and enteritis."

MIRANDA, S. "The Value of Mallein in the Diagnosis of Glanders" (Valor de la malleína en el diagnóstico del muermo). *Revista Hig. y Sanidad Pecuarias*. Vol. IX., No. 5. May 1919. Pp. 286-287.

In all cases the mallein test ought to be accompanied by serological tests (agglutination, precipitation, and deviation of the complement).

MOHLER, J. R. "The Control of Animal Diseases." *Amer. Journ. Vet. Med.* Vol. XIV., No. 4. April 1919. Pp. 155-161.

MULLIE, G. "Swine Fever in Belgium" (La peste porcine dans la partie libre de la Belgique). *Rec. Méd. Vét.* Vol. XCIV., No. 23. 15th December 1918. Pp. 627-631.

The author of this note tried the effect of the repeated subcutaneous injection of a 1 per cent. watery solution of methylene blue in three cases. Two died and one recovered.

MULLIE, G. "Ulcerative Lymphangitis of the Horse. Symptomatology, therapeutics, and Prophylaxis" (Contribution à l'étude de la lymphangite ulcéreuse du cheval. Sa symptomatologie, sa thérapeutique et sa prophylaxie). *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January-15th February 1919. Pp. 34-50.

NÈGRE, L., and BOQUET, A. "Epizootic Lymphangitis. Experiments in Serotherapy" (Essais de sérothérapie d'une affection mycosique chronique (Lymphangite épizootique des solipèdes)). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 4. April 1919. Pp. 269-274.

PATTERSON, J. "Hemorrhagic Septicemia in Horses." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 206-209.

A short account of an outbreak in Iowa. "All animals given medicinal treatment alone died, while all those given either the laboratory serum or the serum from the recovered colt lived, with one exception."

PICKENS, E. M. "Blackleg in an Aged Cow." *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 120-121.

The cow was an aged one in poor condition. The exact age could not be ascertained, but the owner stated that to his positive knowledge the animal had given birth to fourteen calves.

PIED, H. "The Treatment of 'Foot-Rot' in Sheep" (Note de nouveaux procédés de traitement du piétin du mouton et du périonyxis infectieux en général). *Rev. Path. Comp.* Vol. XIX., No. 155. April 1919. P. 24 (112).

The author writes of the good results obtained by the use of a dressing, known in commerce as "Delmess" which is composed of lanolin, subacetate of copper, and trichloride of antimony. The proportions are, secret. The writer is convinced that a mixture of lanolin, ichthyol (1 in 5), and balsam of Peru (1 in 10) would be equally efficacious.

PIOT BEV. "Rinderpest in Egypt" (Recrudescence de la peste bovine en Égypte). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 3. March 1919. Pp. 197-207.

REMLINGER, P. "Paralysis Produced during the Anti-Rabies Immunisation of Rabbits" (Accidents paralytiques étrangers au virus, au cours de l'immunisation antirabique du lapin). *C. R. Soc. Biol.* Vol. LXXXII., No. 7. 15th March 1919. Pp. 254-256.

Attention is called to fatal paralytic symptoms induced by the injection of a homologous emulsion of nervous substance, even in a small dose. The condition resembles that sometimes met with in the human subject undergoing anti-rabies treatment. The rabies virus itself is not the cause. There

may be either a toxin or a poison in normal nervous tissue which can act on animals of the same species.

REMLINGER, P. "The Heredity of Rabies" (Contribution à l'étude de l'hérédité de la rage). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 5. May 1919. Pp. 375-388.

SEDDON, H. R. "Studies in Abortion Disease." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 1. March 1919. Pp. 1-34. 11 Charts.

SLAWSON, A. "Serum and General Therapeutic Treatment of Canine Distemper." *Cornell Veterinarian.* Vol. VIII., No. 4. October 1918. Pp. 267-272.

"Canine distemper serum should not be used for prophylactic purposes alone unless the animal can be isolated from the sources of contagion. If a dog has been exposed to the disease and no certainty exists that he has become infected, serum may be given and the dog may then be isolated. But whether isolation be carried out or not, it is best to inject a small amount of prophylactic vaccine with the specified amount of serum. The simultaneous injections may be given twice, three or four days apart, followed by a third injection of serum alone within two days."

SMITH, T. "A Characteristic Localization of *Bacillus abortus* in the Bovine Fetal Membranes." *Journ. Expt. Med.* Vol. XXIX., No. 5. May 1919. Pp. 451-456. 3 Plates (6 Figures).

This paper deals with the invasion of the cells of the chorionic epithelium by *Bacillus abortus*. The significance of this invasion from the standpoint of pathogenesis cannot be properly evaluated until a more complete history of the successive localisations has been obtained. It is probable that localisations also occur in the walls of the blood-vessels of the chorion. One such case has been observed in which the fusiform cells of the adventitious coat of a blood-vessel 0.8 mm. in diameter were completely replaced by clumps of minute bacilli.

STANGE, C. H. "The Swine Disease Situation" *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No 7. March 1919. Pp. 740-744.

STOCKMAN, S. "The Pathology and Epizootiology of Louping-Ill." *Journ. Board Agric.* Vol. XXVI., No. 1. April 1919. Pp. 24-39. 4 Plates (12 Figures).

"The object of this article is to present, in a more or less popular form, the fundamental conclusions arrived at and deductions therefrom, likely to be of value in practice, omitting experimental and scientific details where they do not seem necessary to explain the results." The article contains

conclusions already published in *Journ. Comp. Path. and Therap.* (this Review, 1917, I. 39; 1919, III. 33).

STRAUS, A. H., and WIGHT, A. C. "Preliminary Report on Ulcerative Lymphangitis in the Horses of the A. E. F." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 180-186.

TASKIN. "The Treatment of Ulcerative and Epizootic Lymphangitis" (Sur le traitement des lymphangites bacillaires et cryptococciques). *Rec. Méd. Vét.* Vol. XCV., No. 2. 30th January 1919. *Bull. Soc. Centr. Méd. Vét.* 9th January 1919. Pp. 37-40.

— "The Treatment of Epizootic Lymphangitis by the Serum of an Animal Cured of the Disease" (Traitement de la lymphangite cryptococcique par le sérum d'animal guéri). *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 138-139.

VELU, H. "Anthrax in Morocco" (Le charbon bactéridien au Maroc). *Bull. Soc. Path. Exot.* Vol. XII., No. 3. March 1919. Pp. 126-127.

The researches of Chauveau led to the demonstration that Algerian sheep are resistant to anthrax of French origin. As a consequence the idea that anthrax of sheep does not exist in Algeria gained credence. Velu points out that anthrax is of frequent occurrence in Morocco, and occurs in both cattle and sheep.

WILLIAMS, W. L. "The Fundamental Principles in the Control of the Infections causing Sterility, Abortion, and Related Losses." *Cornell Veterinarian.* Vol. IX., No. 1. January 1919. Pp. 9-22.

"The veterinary practitioner should grasp clearly and firmly the principle that it is highly dangerous for him to meddle with inoculations with live pathogenic bacteria until the subject has been thoroughly worked out experimentally."

WILLIAMS, W. L., and CARPENTER, C. M. "Researches in the Diseases of Breeding Cattle." *Report New York State Vet. Coll. 1917-18.* 1919. Pp. 51-108. 3 Tables.

Deals largely with Professor Williams' views on contagious abortion.

MEDICINE.

BÉDEL. "Gastritis Caused by Fine Gravel" (Sur une gastrite érosive occasionnée par des graviers). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 59-60.

Relates the symptoms and lesions caused in cattle by taking fine gravel along with the food. The abomasum was constantly the seat of linear erosions of the mucous membrane.

— "‘Railway Fever’ in Cattle" (Note sur le fièvre des chemins de fer des bovins). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 61-64.

BOSI, V. "Cerebro-Spinal Meningitis of the Horse in the Argentine Republic" (Sobre la enfermedad de los equinos). *Revista Zootecnica.* Vol. VI., No. 65. February 1919. Pp. 339-342.

CHAPUIS "Feeding with Sorghum as a Cause of Colic" (Alimentation au sorgho et coliques). *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 277-278.

CINOTTI, F. "Septic Osteomyelitis of the Vertebrae as a Complication of mal del garrese" (Osteomielitis settica vertebrata come complicazione del mal del garrese). *La Clinica Vét.* Vol. XLII., No. 5. 15th March 1919. Pp. 131-137. 1 Figure.

DE LA SOTA Y CASTANOS, J. "Catarrhal Mastitis of the Cow" (Estudio clínico-terapéutico de la mamitis catarral de la vaca). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 5. May 1919. Pp. 297-302.

Extols the value of acetate of ammonium in these cases.

DEVINE, J. F. "Parturient Paralysis, Parturient Apoplexy." *Journ. Amer. Vet. Med.* Vol. XIV., No. 5. May 1919. Pp. 239-241.

A complication to which the author calls attention as being possible in severe and long-continued cases, is uræmia, "which is manifested by clonic contraction of certain sets of muscles, followed by general epileptiform convulsions as the animal lies prostrate on its side. Such a case, in addition to prompt catheterisation and inflation of the udder, should receive the most judicious hypodermic medication of diuretics and diaphoretics; chloral per rectum and lobeline subcutaneously are also indicated. Arecolin and strychnin in these cases are dangerous and almost surely fatal."

FITCH, C. P., BOYD, W. L., and BILLINGS, W. A. "Pancreatic Lithiasis of Cattle." *Cornell Veterinarian*. Vol. IX., No. 2. April 1919. Pp. 68-75. 1 Figure.

GLOVER, G. H., NEWSOM, I. E., and ALKIRE, E. W. "Investigations to Determine the Cause of Certain Sheep Diseases in Colorado." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 1. April 1919. Pp. 5-22. *Ibid.* No. 2. May 1919. Pp. 128-145.

Herein are given details of investigations on an obscure disease causing heavy losses in lambs and pregnant ewes. The authors conclude that the disease is not due to the nature of the food. They found a bipolar organism that was virulent for rabbits. This, together with the discovery of many acute cases with typical lesions of haemorrhagic septicæmia, made the authors feel that much of the trouble was due to *B. ovisepticus*, but that the bacillus alone was probably not the deciding factor.

LIGNIÈRES, J. "Cerebro-Spinal Meningitis of the Horse in the Argentine Republic" (Sobre la enfermedad de los caballos). *Revista Zootecnica*. Vol. VI., No. 64. January 1919. Pp. 282-286.

M'QUARRIE, I., and WHIPPLE, G. H. "Renal Function Influenced by Intestinal Obstruction." *Journ. Exp. Med.* Vol. XXIX., No. 4. April 1919. Pp. 397-419. 12 Tables. "Renal Function Influenced by Proteose Intoxication." *Ibid.* Pp. 421-444. 8 Tables.

As the result of observations conducted on dogs, mostly females, it has been shown that in association with the intoxication of intestinal obstruction there exists a definite impairment of the excretory function of the kidneys. The degree of functional depression corresponds roughly with the intensity of the clinical intoxication. It is probable that the impaired renal function is due to direct action of the toxic substances upon the renal epithelium. The injection of the toxic proteose obtained from the contents of the obstructed small intestine causes a definite impairment of the eliminative function of the kidneys as shown by a decreased capacity to excrete urea, sodium chloride, and phenolsulfonephthalein.

QUIROGA, S. S., and PEPE, R. "'Tembleque' of Sheep in Patagonia" (El tembleque). *Revista Soc. Med. Vet.* Vol. IV., No. 1. January 1919. Pp. 7-14. 3 Figures.

This may be regarded as a reply to Tabusso (this *Review*, 1918, II. 455) who is of opinion that "renguera" is an infectious disease imported into Peru by animals from Patagonia. Quiroga and Pepe contend that "tembleque" is not infectious, but is a disease of alimentary origin. It is not the direct cause of death, and may be cured by the production of a healthy alimentation.

SCHRECK, O. "Chorea in Dog (St. Vitus' Dance)." *Journ. Amer. Vet. Med. Assoc.* Vol. LV, No. 1. April 1919. Pp. 64-68.

SERGENT, EDM. and ET., and LHÉRITIER, A. "Bovine Hæmoglobinuric Biliary Fever in Algeria" (Fièvre bilieuse hémoglobinurique du bœuf d'Algérie, maladie distincte des piroplasmoses). *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 108-120.

SQUAIR, C. A. "The Obscurity of Heart Diseases in our Animals." *Vet. News.* Vol. XVI., No. 801. 10th May 1919. P. 152.

VALLERY-RADOT, P., and LHÉRITIER, A. "Bovine Hæmoglobinuric Biliary Fever in Algeria" (Étude sur la pathogénie de la fièvre bilieuse hémoglobinurique des bovins en Algérie). *C. R. Soc. Biol.* Vol. LXXXII., No. 11. 12th April 1919. Pp. 389-391. *Bull. Soc. Path. Exot.* Vol. XII., No. 4. April 1919. Pp. 202-209.

VAN SACEGHEM, R. "Osteoporosis of the Horse in the Belgian Congo" (Contribution à l'étude de l'ostéoporose au Congo belge). *Bull. Path. Exot.* Vol. XII., No. 5. May 1919. Pp. 238-243.

VELU, H. "An Undescribed Disease of the Dog in Morocco" (Une affection non décrite du chien observée au Maroc). *Bull. Soc. Path. Exot.* Vol. XII., No. 3. March 1919. Pp. 132-134. 1 Plate (5 Figures).

WILSON, I. D. "Economical Tank for Air Treatment of Parturient Paresis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 749-750. 1 Figure.

Details and a plan of a tank are given. The author of the note claims the following advantages for the apparatus:—(1) Sterile air is provided; (2) convenient and inexpensive to use; (3) does not suggest to the laity to "rig up" the bicycle or automobile pump to treat their own cases.

METHODS.

ARNAUD, R. "A Rapid Panoptic Method of Staining Blood and Parasites in Smears" (Note sur une méthode panoptique rapide de coloration du sang et des parasites dans les frottis). *C. R. Soc. Biol.* Vol. LXXXII., No. 5. 1st March 1919. Pp. 208-209.

May-Grünwald stain is used, followed by Manson's borate methylene blue.

KENDALL, A. I., and RYAN, M. "A Double Sugar Medium for the Cultural Diagnosis of Intestinal and Other Bacteria." *Journ. Inf. Dis.* Vol. XXIV., No. 4. April 1919. Pp. 400-404. 2 Tables.

"The Russell double sugar medium and the medium described here will give all the essential fermentation reactions of the important intestinal bacteria of pathogenic importance. . . . The double sugar mediums can be advantageously applied to the cultural diagnosis of aerobic bacteria in general."

LEIDY, J. "Modification of Gram's Stain for Positive Bacteria." *Journ. Lab. and Clin. Med.* Vol. IV., No. 6. March 1919. P. 354.

"With the iodides of magnesium, soda, arsenic, aluminium, zinc, iron, both ferrous and ferric, an equally satisfactory result was obtained as with potassium. The iodine dissolves more slowly with ferric iodide and arsenious iodide than with the others, which, however, is not objectionable. In the case of the ferrous iodide and arsenic iodide, we thought the stain was rendered a deeper hue."

LESIEUR, C., JACQUET, P., and PINTENET. "A Simplified Method of Staining Tubercl Bacilli in Sputum" (Sur un procédé simplifié de coloration des crachats tuberculeux). *C. R. Soc. Biol.* Vol. LXXXII., No. 7. 15th March 1919. Pp. 251-252.

One gramme of gentian violet is triturated in a mortar with 10 c.c. of 90-95 per cent alcohol (absolute alcohol is not necessary). After complete solution, 5 per cent. solution of phenol in water is added to make up to 100 c.c. This stain is used in the same manner as the Ziehl stain.

Decoloration is effected with strong alcohol to which 3 per cent. by weight, or 2 per cent. by volume of lactic acid has been added. Safranin (1 in 500 of anilin water) is used as a counterstain.

MALONE, R. H. "A Simple Apparatus for Isolating Single Organisms." *Journ. Path. and Bacteriol.* Vol. XXII., No. 2. November 1918. Pp. 222-223. 1 Figure.

SIMMONS, J. E. "A Comparison, with the Standard Plate Method, of Some Rapid Methods for Bacteriologic Analysis of Milk." *Journ. Inf. Dis.* Vol. XXIV., No. 4. April 1919. Pp. 322-336. 5 Tables, 2 Charts.

OBSTETRICS.

BÉDEL. "Uterine Souffle in the Large Domestic Animals" (Sur le bruit de souffle utérin chez nos grands femelles). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 50-52.

BOUDEAUD. "Retention of the Placenta in the Mare" (Non-délivrance de la jument. Pression et traction combinées). *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January 1919-15th February 1919. Pp. 50-51.

FRINK, W. E. "'The Sterility Problem' as Presented to the Country Practitioner." *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 103-109.

GIOVANOLI, G. "Pathological Alteration of the Foetus as a Cause of Dystocia" (Krankhafte Veränderungen der Leibesfrucht als Geburts-hindernis). *Schweizer Arch. f. Tierheilk.* Vol. LXI., Nos. 4. April 1919. Pp. 175-180.

HALLMAN, E. T. "A Preliminary Report on the Pathology of the Reproductive Organs in Sterility." *Cornell Veterinarian.* Vol. IX., No. 1. January 1919. Pp. 28-36. 2 Plates (10 Figures).

The data reported in this paper were obtained from a study of four cows. The lesions were not extensive but were the result of a mild type of inflammation. Superficial lesions involved the epithelium, and there were small deep lesions in the mucous membrane of the uterus. "There is no other apparent satisfactory explanation to the author than that the more deeply seated lesions of the mucosa represent foci of infection with micro-organisms of comparatively low virulence yet able to establish themselves for varying periods of time. It is not conceivable that infection in the uterine cavity could explain the deeper, more localised, lesions of the mucosa, but that such lesions could arise only from foci of infection in the deeper parts."

MORGAN, E. "Agglutination of the Blood Corpuscles as a Sign of Pregnancy." *Vet. Journ.* Vol. LXXV., No. 4. April 1919. Pp. 143-144.

PARASITOLOGY

(Including Entomology and Protozoology).

BÉDEL. "Equine Oxyurosis" (Note sur l'oxyurose du cheval). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 6th February 1919. Pp. 64-69.

BOUIN. "Trypanosoma lewisi in Southern Morocco" (De l'existence à Marrakech et dans la région (Sud-Marocain) du *Trypanosoma lewisi* Kent). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 20th February 1919. Pp. 95-96.

In Marrakech and its neighbourhood, *Trypanosoma lewisi* infests a large number of the rats. Out of 126 animals examined 54 were discovered on the first examination to harbour the organism. Endeavour to infect the dog and mouse gave negative results.

BOUIN. "Recovery of a Dog Inoculated with *Trypanosoma marocanum*" (Guérison d'une chienne inoculée avec *Trypanosoma marocanum*). *Rec. Méd. Vét.* Vol. XCV., No. 4. 28th February 1919. *Bull. Soc. Centr. Méd. Vét.* 20th February 1919. Pp. 96-100.

On 9th March 1916 a bitch was inoculated with blood from a mare. Trypanosomes appeared rapidly in the blood, and by the 12th March were very numerous. For ten months the infection was manifested by alternating periods of exacerbation and amelioration of symptoms. Ocular lesions (keratitis, etc.) were present, and also varied in intensity; but when the general symptoms were serious and trypanosomes numerous in the blood, the ocular lesions were less marked. Whereas, when the general symptoms were less marked, the ocular lesions were more pronounced. In January 1917 it was no longer possible to find trypanosomes in the blood; but inoculation of guinea pigs was positive until May 1917. After this inoculations were negative, and the bitch was considered to have recovered.

CAZALBOU, L. "Parasitic Mange and Sulphuration" (Gale et sulfuration). *Rec. Méd. Vét.* Vol. XCV., No. 6. 30th March 1919. *Bull. Soc. Centr. Méd. Vét.* 20th March 1919. Pp. 119-126.

CURASSON, G. "Galyl in the Treatment of 'Souma' of the Horse" (Le galyl dans le traitement de la souma du cheval). *Rec. Méd. Vét.* Vol. XCIV., No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 5th December 1918. Pp. 497-500.

Curasson uses a mixture according to the following formula:—

Galyl	.	.	.	.	1·0	gramme.
Phosphate of sodium	.	.	.	0·37	"	
Caffein	.	.	.	0·25	"	
Benzoate of sodium	.	.	.	0·28	"	

Two grammes of this mixture are dissolved in 5 c.c. of distilled water. The solution undergoes rapid alteration when exposed to the air. If a single dose of 2 grammes, injected into the jugular, does not effect a cure, this follows a second injection of 1 gramme made a week after the first.

DELMER, A. "The Treatment of Parasitic Mange" (Note relative au traitement de la gale des équidés). *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 262-266.

DEL SKIPPIA, G. "A Gas Mask for Use during Sulphuration in the Treatment of Parasitic Dermatoses of Equines" (Di un mezzo per compiere la cura coi gas nelle dermatosi parassitarie degli equidi). *Il Nuovo Ercolani.* Vol. XXIV., No. 5. 15th March 1919. Pp. 49-54. 4 Figures.

Describes and figures a mask to which is attached a tube, through which air can be inspired, leading to the outside of the sulphuration chamber.

- DEMORA.** "The Treatment of Parasitic Mange" (Sur le traitement de la gale). *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 258-262.
- DI DOMIZIO, G.** "Trypanosomiasis of the Dromedary in Eritrea" (Circa un tripanosoma dei dromedari nella Colonia Eritrea). *La Clinica Vet.* Vol. XLII., No. 4., 28th February 1919. Pp. 127-128.
- "Anaplasma Marginale" (Dell' anaplasma marginale. (Corpi di Jolly nel sangue anemico. Forme anaplasmatiche di piroplasmi)). *La Clinica Vet.* Vol. XLII., No. 7. 15th April 1919. Pp. 203-220. *Ibid.* No. 8. 30th April 1919. Pp. 237-251. *Ibid.* Nos. 9-10. 15th-31st May 1919. Pp. 292-311. 2 Text-Figures, 2 Plates (12 Figures).
- DUKE, H. L.** "Some Observations on the Bionomics of *Glossina palpalis* on the Islands of Victoria Nyanza." *Bull. Entom. Res.*, Vol. IX., No. 3. March 1919. Pp. 263-270.
- "There has been, without doubt, a marked reduction in the numbers of fly on the islands visited. The only factor that offers a reasonable explanation is the destruction of breeding grounds by the rising water."
- EVANS, A. M.** "On the Genital Armature of Female Tsetse-Flies (*Glossina*)."
Ann. Trop. Med. and Parasitol. Vol. XIII., No. 1. May 1919. Pp. 31-56. 18 Figures.
- EVE, H. B.** "Psorospermosis or Rabbit Disease." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. P. 109.
- FINKELSTEIN, B. J.** "Orokinase and Salivary Digestion in the Horse, Cow, and Pig." *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 138-144. 6 Tables.
- HAGAN, W. A.** "The *Strongylidae* Infesting the Horse." *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 169-179. 1 Plate (7 Figures).
- HALL, M. C.** "Practical Methods of Treatment for Worm Infestation." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 1. April 1919. Pp. 24-45. 1 Figure.
- "In the present state of our knowledge our best anthelmintics for certain purposes are oil of chenopodium, which is perhaps the most valuable anthelmintic known, santonin, valuable where repeated doses are desired and gastro-intestinal irritation must be avoided, turpentine, which acts in some respects like a weaker oil of chenopodium, copper sulphate,

valuable in the ruminants where its emetic action is not manifested, and tobacco, which seems to be adapted to the peculiar task of removing heterakids from the caeca of poultry."

HALL, M. C., and HOSKINS, H. P. "The Occurrence of Tapeworms, *Anoplocephala* spp., of the Horse in the United States." *Cornell Veterinarian* Vol. VIII., No. 4. October 1918. Pp. 287-292.

The authors have collected the available records of the occurrence of *Anoplocephala magna*, *A. perfoliata*, and *A. mammilana*. Short descriptions are given.

HENRY. "Demora's Memoir on the Treatment of Mange by Sulphuration" (Sur un mémoire de M. Demora, vétérinaire major de 2e classe, relatif à la guérison de la gale par les gaz sulfureux). *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January-15th February 1919. Pp. 28-34.

Relates to the report by Demora abstracted in this *Review*, 1919, III. 190.

HORNBY, H. E. "Some Notes on the Use of Tartar Emetic in the Treatment of Domestic Animals affected with African Trypanosomiasis." *Vet. Journ.* Vol. LXXV., No. 3 March 1919. Pp. 89-103.

— "The Trypanosomes Found in Domestic Mammals in South-Central Africa." *Vet. Journ.* Vol. LXXV., No. 4. April 1919. Pp. 128-138.

A general survey.

HOSKINS, H. P. "A Note in Regard to the Seasonal Appearance of *Anoplocephala mammilana*." *Cornell Veterinarian*. Vol. IX., No. 2. April 1919. Pp. 110-111.

Since Hall and Hoskins (*vide supra*) reported the finding of *Anoplocephala mammilana* in two subjects at Rochester, Mich., this parasite has been found in two more horses at the same place, making four cases in all. The post-mortem examinations, at which the tapeworms were found, were all made between 19th April and 4th June.

IMES, M. "Cattle Scab and Methods of Control and Eradication." *Farmers' Bull.* 1017. U. S. Dept. Agric. December 1918. Pp. 29. 15 Figures.

Cattle scab can be eradicated by dipping or spraying, but dipping is the better method of treatment. Lime-sulphur dips, nicotin dips, and crude-petroleum dips are efficacious. Methods of preparing and using these dips are described, and the intervals between dippings and the conditions under

which the various dips may safely be used for the different kinds of scab are discussed. Plans of cattle-dipping plants and directions for building vats for dipping cattle are given.

LEGER, M., and VIENNE, M. "Epizootic Trypanosomiasis in Bovines in French Guiana" (*Epizootie à trypanosomes chez les bovidés de la Guyane française*). *Bull. Path. Exot.* Vol. XII., No. 5. Pp. 258-266.

LÉPINAY, L. "Equine Parasitic Mange" (Note sur l'emploi des gaz sulfureux dans le traitement de la gale du cheval). *Rev. Path. Comp.* Vol. XIX., No. 154. March 1919. P. 10 (70). (La gale du cheval.) *Ibid.* Pp. 25 (85)-26 (86).

LLAMBIAS, J. "Alveolar Echinococcus of Bovines" (*Equinococo alveolar de los bovinos*). *Revista Zootecnica.* Vol. VI., No. 66. March 1919. Pp. 417-430.

MAS ALEMANY, J. "Piroplasmosis or Bovine Malaria Diagnosed Clinically in the Province of Barcelona" (*La piroplasmosis o malaria de los bóvidos diagnosticada clínicamente en la provincia de Barcelona*). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 5. May 1919. Pp. 295-297.

MIGEOTTE. "Sarcoptic Mange of the Horse" (À propos du traitement de la gale sarcoptique du cheval). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 326. February 1919. Pp. 70-74.

A brief consideration of the various methods of treatment that have been suggested.

MILLER, D. "Some Noteworthy Flies affecting Live-Stock." *N. Z. Journ. Agric.* Vol. XVIII., No. 1. January 1919. Pp. 10-14. 13 Figures.

"Fortunately, at the present time in New Zealand there is practically no serious loss to domestic animals through the agency of such species (of Diptera). . . . It is also noteworthy that we have no record of any indigenous fly attacking domestic animals, a fact which may be due to the absence before the advent of white man of any mammals suitable as hosts Sheep are frequently exposed to the attack of maggot-flies, the larvæ of which destroy the wool. Of these species occurring in New Zealand, the yellow or golden-haired blow-fly (*Pollenia villosa*) is the most noteworthy The greenbottle-fly is another injurious form. . . . The other two species of blow-flies which should be closely observed in regard to possible damage to wool are European bluebottle (*Calliphora erythrocephala*) and the New Zealand bluebottle (*C. quadrimaculata*)."

MISSENARD, R. "‘Summer-Sores’ with Pulmonary Complications" (Plaies d’été avec complications pulmonaires). *Rec. Méd. Vét.* Vol. XCIV, No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 5th December 1918. Pp. 490-491.

A sixteen-year-old horse, with two “summer-sores” at the medial angle of the eye, developed symptoms of pulmonary disorder. On post-mortem examination, numerous subpleural nodules were discovered at the upper-anterior part of the lung, and a few similar nodules in the interior of the lung. They contained caseous material in which were granules similar to those of the sores on the face. When emptied, the nodules showed a smooth capsule surrounded by inflamed parenchyma. There were some foci of pneumonia, more or less diffuse, in both lungs. The bronchial lymph glands and those beneath the tongue were inflamed and hypertrophied, but showed no lesions on section. There were no lesions in the digestive tract.

MOHLER, J. R. “Tick Eradication Plans for 1919.” *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 745-748.

NEWSOM, I. E. “Gid in Sheep.” *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 199-201. 2 Figures.

The case is reported for the purpose of establishing an accurate record of the occurrence of the gid parasite in Colorado, since Hall has said “the parasite has been reported apparently correctly from Ohio, Illinois, Michigan, Missouri, Kansas, Indian Territory and Nevada, but there are doubtful records from Utah, Colorado and Tennessee.”

NORGET, L. A. “Unusual Verminous Lesions in Two Young Colts.” *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 123-124.

In one case there were several large perforations of the colon near its lower end, caused by intestinal parasites. The bowel contained *Strongylus vulgaris*, both free and encysted, in great numbers. In the second case there were also a number of strongyles in the colon, and an aneurysm of the colic artery. The lumen of the vessel “was practically closed by masses of fibrin in which the larvae of *Strongylus vulgaris* were numerous.”

[For an account of a case in which *Strongylus vulgaris* was present in the aorta of a horse, see Hoare, *Vet. News*, 1918, xv. 276.]

PARODI, S. E., and WIDAKOVICH, V. “The Traumatic Action of *Strongylus equinus*” (Acción traumática del *Strongylus equinus*). *Revista Zootécnica* Vol. VI, No. 64. January 1919. Pp. 277-282. 3 Plates (9 Figures).

PICKENS, E. M., and SHIVERS, C. C. “Paralysis in the Hind Quarters of a Sow due to Kidney Worms.” *Cornell Veterinarian.* Vol. IX., No. 2. April 1919. Pp. 124-126.

Abscesses of the kidneys were found to contain *Stephanurus dentatus* (*Sclerostoma pinquicola*) in large numbers.

QUEVEDO, J. M. "A Variety of 'Tristeza'" (Sobre una variedad de la "tristeza" causada por piroplasmas pequeños). *Revista Soc. Med. Vet.* Vol. III, No. 14. December 1918. Pp. 504-509. 2 Figures.

From observations he has made, the author would provisionally suggest the application of the name *Babesia minor* to the small haemosporidia of South-American cattle.

RAILLIET, A. "Bovine Intestinal Coccidiosis" (La coccidiose intestinale ou dysenterie coccidienne des bovins). *Rec. Méd. Vét.* Vol. XCV., Nos. 1-3. 15th January-15th February 1919. Pp. 5-27.

A general survey of the literature dealing with the disease. An extensive bibliography is given.

— "Onchocerciasis and Fistulous Withers" (L'oncocercose cervicale et le mal de garrot). *Rec. Méd. Vét.* Vol. XCV., No. 6. 30th March 1919. *Bull. Soc. Centr. Méd. Vét.* 6th March 1919. Pp. 111-116.

— "The Acanthocephalid Parasites of the Domestic Animals" (Les acanthocéphales des animaux domestiques). *Rec. Méd. Vét.* Vol. XCV., No. 7. 15th April 1919. Pp. 185-198.

A general review of the acanthocephalid parasites and an account of the literature on the subject. A bibliography is given of recent papers that do not figure in the *Index Catalogue of Medical and Veterinary Zoology*. The article should be consulted in the original.

RANSOM, B. H. "Practical Methods of Prophylaxis against Worm Infections." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 1. April 1919. Pp. 46-56.

RANSOM, B. H., and FOSTER, W. D. "Recent Discoveries concerning the Life History of *Ascaris lumbricoides*." *Journ. Parasitol.* Vol. V., No. 3. March 1919. Pp. 93-99.

RYAN, J. F. "Filaria immitis in Dog's Heart." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. P. 199.

The author of this note has never heard of *Filaria immitis* so far north. "The dog (a bulldog, eight years old) was born in New Jersey and never lived elsewhere until he was brought to Lagrange, Illinois."

SCHWARTZ, B. "A Blood-Destroying Substance in *Ascaris lumbricoides*." *Journ. Agric. Res.* Vol. XVI., No. 9. 3rd March 1919. Pp. 253-258.

This is a preliminary report of experiments with extracts from *Ascaris lumbricoides* of the pig (*A. suum*). "The body fluid of *A. lumbricoides* taken from worms shortly after their removal from the host is not haemolytic to

the washed erythrocytes of swine, cattle, sheep, rabbits, guinea-pigs, and rats. The fluid from worms which after removal from their host are kept alive in salt solution for a few days acquires haemolytic properties. Fluid from worms kept *in vitro* for twenty-four hours is only slightly haemolytic if at all, but fluid from worms kept under similar conditions from six to eight days is decidedly destructive to the red blood corpuscles of swine and sheep." It appears possible that the haemotoxic substances partake of the nature of endotoxins.

SERGENT, EDM., and LHÉRITIER, A. "Parasitic Mange in the Dromedary" (*Gale du dromadaire (Première note)*). *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 94-99. 5 Figures.

SERGENT, EDM. and ET., and LHÉRITIER, A. "Immunity of Dromedaries against Trypanosomiasis" (*Dromadaires immunisés contre la trypanosomiase "debab"*). *Bull. Soc. Path. Exot.* Vol. XII., No. 2. February 1919. Pp. 86-90. 3 Charts.

The authors have observed two cases of immunity against *Trypanosoma berberum* in dromedaries. In one case the immunity followed laboratory inoculation. In the other the immunity was natural.

— "Passage of Trypanosomes from the Mother to the Foetus" (*Passage de trypanosomes de la mère au fœtus dans le "debab"*). *Bull. Soc. Path. Exot.* Vol. XII., No. 4. April 1919. Pp. 177-178.

In two camels inoculated with *Trypanosoma berberum* fever appeared on third day, and the first trypanosomes were detected on the fifth day. One of the camels aborted on the thirty-sixth day, and the other on the sixty-fourth day. In the blood of the still-born foetus in each case trypanosomes were found microscopically, and the dog was infected by intraperitoneal inoculation.

SOULET. "The Differential Diagnosis and Treatment of Parasitic Mange" (*Contribution à l'étude du diagnostic différentiel et du traitement de la gale des solipèdes aux armées*). *Rev. Gén. Méd. Vet.* Vol. XXVIII., No. 325. January 1919. Pp. 1-12.

VELU, H. "Osarsan in the Treatment of Trypanosomiasis" (*Trypanosomiase des chevaux du Maroc. Guérison de la maladie expérimentale du chien par l'osarsan*). *Bull. Path. Exot.* Vol. XII., No. 5. May 1919. Pp. 220-223. 2 Charts.

The author has tried the effect of osarsan (a derivative of diaminoarsenobenzene) in experimental trypanosomiasis of dogs, and has arrived at the conclusion that the drug has both preventive and curative properties. *Trypanosoma moracanum* is very sensitive to injections made in series and in large doses. The drug has also been used with success in "debab" and dourine.

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VIDELIER, A. "Parasitic Mange" (À propos de la gale (Blanchir n'est pas guérir)). *Rec. M&l. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 266-268.

WATTS, H. R. "The Hog Louse: *Hæmatopinus suis* (Linnaeus) Leach." *Bull. No. 120.* Agric. Exp. Station, Univ. Tennessee. July 1918. Pp. 16. 7 Figures.

WIGDOR, M. "Some Studies on *Belascaris marginata* and *Toxascaris limbata*, Including a Simple Method of Differentiating them." *Cornell Veterinarian.* Vol. VIII., No. 4. October 1918. Pp. 273-281. 12 Figures.

YORKE, W., and MACFIE, J. W. S. "Strongylidae in Horses. VII. *Cylicostomum pateratum* sp. n." *Ann. Trop. Med. and Parasitol.* Vol. XIII., No. 1. May 1919. Pp. 57-62. 9 Figures.

Describes a new species.

YOSHIDA, S. "On the Development of *Ascaris lumbricoides* L." *Journ. Parasitol.* Vol. V., No. 3. March 1919. Pp. 105-115. 1 Plate (12 Figures).

This paper originally appeared in *Tokyo Iji Shunshi* (*Tokyo Weekly Medical Journal*).

PATHOLOGY AND BACTERIOLOGY.

DIEHL, H. S. "The Specificity of Bacterial Proteolytic Enzymes and their Formation." *Journ. Inf. Dis.* Vol. XXIV., No. 4. April 1919. Pp. 347-361. 1 Table.

DONALDSON, R. "Character and Properties of the 'Reading' Bacillus, on which a New Method of Treatment of Wounds has been Based." *Journ. Path. and Bacteriol.* Vol. XXII., No. 2. November 1918. Pp. 129-151. 1 Plate (4 Figures).

Donaldson and Joyce have previously introduced a method of treating wounds by means of a bacillus to which they applied the name "Reading" (see abstract in this *Review*, 1918, II. 70). "The bacillus is a spore-bearing anaerobe of a saprophytic nature, belongs to the proteolytic group of anaerobic organisms, and is probably present in the majority of gunshot wounds, but its activities are generally held in abeyance by the system of wound-dressing usually adopted. . . . It most closely resembles *B. sporogenes* (Metchnikoff), from which, however, it differs in certain points. . . . Experiments show that it is non-pathogenic for animals as well as for man when introduced in the latter into septic wounds. It does not attack living tissues, the cell response of which to the introduction of the bacillus has been investigated. . . . It disintegrates the protein base from

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which pathogenic organisms operate, and while so doing does not itself give rise to fresh toxic substances."

GILTNER, L. T. "Occurrence of Coccidioidal Granuloma (Oidiomycosis) in Cattle." *Journ. Agric. Res.* Vol. XIV., No. 12. 16 September 1918. Pp. 533-543. 2 Plates (6 Figures).

GOLDBERG, S. A. "Certain Aspects of the Pathology of Spavin." *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 145-148.

"Lesions similar to those found in spavin were produced in dogs and in pigs by inoculation of micro-organisms. These experimental data, the early changes being those of infection, and the actual finding of micro-organisms, in many instances, lead to the belief that spavin is very often caused by infection."

HUGUENIN, B. "The Culture of Tumour-Cells" (Über Geschwulstzellenkulturen). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 4. April 1919. Pp. 180-181.

KOSER, S. A., and RETTGER, L. F. "Studies on Bacterial Nutrition. The Utilisation of Nitrogenous Compounds of Definite Chemical Composition." *Journ. Inf. Dis.* Vol. XXIV., No. 4. April 1919. Pp. 301-321. 8 Tables.

M'NIDER, W. DE B. "A Functional and Pathological Study of the Chronic Nephropathy induced in the Dog by Uranium Nitrate." *Journ. Exp. Med.* Vol. XXIX., No. 5. May 1919. Pp. 513-529. 5 Plates (5 Figures), 4 Tables.

MAGROU, J. "The Actinomycotic Forms of Staphylococcus" (Les formes actinomycotiques du staphylocoque). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 5. May 1919. Pp. 344-374. 2 Text Figures, 1 Coloured Plate (6 Figures).

MARBAIS, S. "Classification of Staphylococci" (Sur la classification des staphylocoques). *C. R. Soc. Biol.* Vol. LXXXII., No. 6. 8th March 1919. Pp. 220-222.

The author divides staphylococci into five groups.

MASON, F. E. "Pseudo-Actinomycosis or Streptothricosis in the Camel." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 1. March 1919. Pp. 34-42. 4 Figures.

"The writer believes that he has described a streptothricosis or pseudo-actinomycosis in the camel, caused by a species of streptothrix which has not previously been recorded, and he therefore proposes to name it the *Streptothrix camelii*."

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PETIT, G. "The Mechanism of Pigmentation in Melanotic Sarcoma" (Le mécanisme de la pigmentation dans le sarcome mélanique). *Rec. Méd. Vét.* Vol. XCV., No. 5. 15th March 1919. Pp. 121-130. 6 Figures.

SANDERS, W. E. "The Nature of the Lymphocytosis of Acute Infections." *Journ. Lab. and Clin. Med.* Vol. IV., No. 6. March 1919. Pp. 344-346.

"We therefore believe that they (the lymphocytes) are the immature histological antecedents of the granular myelocyte, viz. the nongranular myeloblast, and that future studies by the more recent methods will show the leucocyte of the infective lymphocytosis and most likely the acute lymphoid leucæmias to be of myeloid instead of lymphoid origin."

SANI, L. "Primary Tumour of the Peritoneum in the Dog" (Su di un caso di tumore primitivo del peritoneo nel cane). *Il Nuovo Ercolani.* Vol. XXIV., No. 6. 31st March 1919. Pp. 65-71. *Ibid.* Nos. 7-8. 15th-30th April 1919. Pp. 89-93. *Ibid.* No. 9. 15th May 1919. Pp. 97-100. *Ibid.* No. 10. 31st May 1919. Pp. 116-119. 2 Figures.

SEGALÉ, M. "The Temperature of Acutely Inflamed Peripheral Tissue." *Journ. Exp. Med.* Vol. XXIX., No. 3. March 1919. Pp. 235-249.

"The experiments set forth here establish the fact that the heat of the inflamed part has its origin primarily in the local biochemical activity of the cellular elements which participate in the inflammatory process. The inflammatory hyperæmia, instead of being the necessary and constant source of the inflammation, must be considered a natural physiological compensation for the abnormal local calorification. The rapid circulation of the blood in the inflamed part tends to moderate the increase in local temperature, and to equalise the temperature with that of other parts of the body."

WADSWORTH, A. B. "A Study of the Endocardial Lesions developing during Pneumococcus Infection in Horses." *Journ. Med. Res.* Vol. XXXIX., No. 3. January 1918. Pp. 279-292. 6 Plates (15 Figures).

WOLF, C. G. L. "Contributions to the Biochemistry of Pathogenic Anaerobes." V. The Biochemistry of *Vibrio septique*." *Journ. Path. and Bacteriol.* Vol. XXII., No. 2. November 1918. Pp. 115-128. 8 Tables.

"*V. septique* is essentially an organism whose activities are directed to an attack on carbohydrates. It grows freely in so-called carbohydrate-free media, producing considerable quantities of gas, but the addition of a carbohydrate accelerates metabolism. The acid production is not at all so marked as with *B. welchii*. . . . A certain amount of proteolysis takes

place, which is of the same order as that obtained with *B. welchii*, but it is in no way commensurate with the attack which the *V. septique* makes upon carbohydrates." [See also abstract of Miss Robertson's notes on *V. septique*, this *Review*, 1918, II. 325.]

PHARMACOLOGY AND THERAPEUTICS.

ALARCON Y SANCHEZ MUÑOZ, T. "Sulphonal in Veterinary Medicine" (El sulfonal en la medicina de los animales, y muy particularmente en clínica canina). *Revista Hig. y Sanidad Pecuarias*. Vol. IX., No. 5. May 1919. Pp. 288-291.

Sulphonal is particularly useful before operations. It is of great value in the treatment of post-distemper chorea in dogs. In these cases 1 to 2 grammes (according to the size of the dog) should be given daily, in doses of 25 centigrammes every six hours in warm milk.

COMPTON, A. "Treatment of Staphylococcal Infections by Stannoxyd. 'Mixed Infection' of Pulmonary Tuberculosis." *Journ. Roy. Army Med. Corps.* Vol. XXXII., No. 3. March 1919. Pp. 220-226. 3 Charts, 2 Tables.

Marked improvement followed the administration of stannoxyd. (For earlier communications on the value of stannoxyd in staphylococcal infections, see this *Review*, 1918, II. 326.)

FAYET, P. A. "Intravenous Injections in the Larger Herbivora" (Des injections intraveineuses chez les grands herbivores). *Rev. Path. Comp.* Vol. XIX., No. 155. April 1919. Pp. 17 (105)-19 (107).

The author has introduced truly large doses of picric acid and chloroform into the circulation of several horses without the production of disturbing toxic effect. The operation itself is simple. It suffices to take the most elementary precautions and to be sure that the instrument, needle or trocar, is well in the vein (jugular).

KUBOTA, S. "On the Pharmacological Action of Allocain S. (A New Local Anesthetic)." *Journ. Pharmacol. and Exp. Therap.* Vol. XII., No. 7. February 1919. Pp. 361-376. 5 Tables.

"Allocain S. causes a local paralysis of the sensory nerve endings and nerve fibres, and its anæsthetic power is stronger than novocain and weaker than cocaine. . . . Allocain S. has a good character as a local anæsthetic in many respects, but on the other hand it has also some unfavourable qualities. On account of the slight irritation by its acid solutions and of its precipitation by tissue fluids, its use is limited." In an addendum, the author states

that allocain S. has been tried in several hundred cases of operation with success. Recently the discoverer of the drug claims to have improved the method of preparation so that its solutions are no longer irritating to the tissues.

LEVINE, S. A. "The Action of Strophanthin on the Living Cat's Heart" *Journ. Exp. Med.* Vol. XXIX., No. 5. May 1919. Pp. 485-512. 3 Plates (4 Figures), 4 Tables.

"Cats vary considerably in their susceptibility to strophanthin and in the extent of the difference between the minimum lethal dose and the minimum toxic dose. The amount of strophanthin necessary to produce a toxic effect in a given cat is independent of the speed of administration to a period of four hours. An improvement in the clinical administration of the drug is thereby indicated."

M'MASTER, P. D. "The Germicidal Power of Antiseptic Oils and of Substances Dissolved in Oil." *Journ. Inf. Dis.* Vol XXIV., No. 4. April 1919. Pp. 378-385 2 Tables.

"A method which may provisionally be regarded as satisfactory for determining quantitatively the germicidal power of antiseptic oils and substances dissolved in oil has been developed. Phenol dissolved in mineral oil has germicidal value approaching that of its value in water (under the limited conditions of our test) and can serve as an arbitrary standard for comparison when testing the activity of other oils and oil-soluble substances."

MARCENAC. "Pastes for the Treatment of Dermatoses" ("Pâtes" et "pommades" dans le traitement des dermatoses). *Rec. Méd. Vét.* Vol. XCIV., No. 24. 30th December 1918. *Bull. Soc. Centr. Méd. Vét.* 19th December 1918. Pp. 508-511.

ROSENTHAL, G. "The Intravenous Injection of Bromide of Potassium in Concentrated Sugar Solution" (L'injection intraveineuse de bromure de potassium en solution sucrée concentrée). *Rev. Path. Comp.* Vol. XIX., No. 154. March 1919. Pp. 4 (64)-6 (66).

Though the dog supports the intravenous injection of bromide of potassium without inconvenience, the injection of a simple watery solution causes considerable circulatory depression. The depression following the injection of the salt in a sugar solution, on the other hand, is very slight.

TASKIN. "The Intravenous Injection of Tincture of Opium" (Injections intraveineuses de teinture d'opium). *Rec. Méd. Vét.* Vol. XCV., No. 8. 30th April 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd April 1919. Pp. 139-141.

TATHAM, G. T. P. "Note on the Connexion between Chemical Composition and the Phenol Coefficient of Liquor Cresoli." *Journ. Roy. Army Med. Corps.* Vol. XXXII., No. 3. March 1919. Pp. 227-228.

"Weight for weight the germicidal value of the phenols is greater than that of the hydrocarbons in the ratio of 10:3. . . . Given the analyses of the 'high-boiling tar acids' and of the creosote oil to be employed in the manufacture of liquor cresoli, it should be practicable to calculate from the percentages of the three ingredients used the phenol coefficient of the resulting disinfectant; or, *vice versa*, required a disinfectant of specific phenol coefficient to calculate the percentages in which the respective ingredients should be employed."

TUTT, J. F. D. "The Subcutaneous Injection of Tallianine in Cases of Respiratory Disease." *Vet. Journ.* Vol. LXXV., No. 5. May 1919. Pp. 180-184.

PHYSIOLOGY.

BIERRY, H. "The Development of Glycosuria in the Dog after Total Ablation of the Pancreas" (Marche de la glycosurie chez le chien dans les premières heures qui suivent l'ablation totale du pancréas). *C. R. Soc. Biol.* Vol. LXXXII., No. 9. 29th March 1918. Pp. 305-307.

In nine observations glycosuria appeared in the dog in the first five hours that followed total ablation of the pancreas. Glycosuria is established rapidly and may reach 5 to 10 per cent. at the end of the first hour after the first appearance of glucose in the urine.

BONARD, H. "The Normal Blood of the Horse" (Le sang normal du cheval Sa densité et sa teneur en hémoglobine mesurée avec l'hémomètre Sahli). *Schweizer Arch. f. Tierheilk.* Vol. LXI., No. 3. March 1919. Pp. 113-137. *Ibid.* No. 4. April 1919. Pp. 160-174. 2 Figures, 15 Tables.

GOWEN, J. W. "Variations and Mode of Secretion of Milk Solids." *Journ. Agric. Res.* Vol. XVI., No. 3. 20th January 1919. Pp. 79-102. 12 Tables.

HAYDEN, C. E. "A Preliminary Report on the Urine Analysis of the Dairy Cow." *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 149-155.

From his observations, the author concludes that the urine of the cow has a specific gravity that ranges from 1015 to 1045. Its normal reaction is alkaline. It is not viscid like the urine of the horse. Chlorides are eliminated in small quantities. The phosphate content is small, very often

negative. Uric acid occurs in much larger quantities than is stated by veterinary physiologists. A small amount of indican is present in most samples. Albumin and sugar are both present occasionally.

LAURIE, D. F. "Fertilisation of Hens' Eggs. A Record of Experimental Work in Deciding the Duration of the Influence of the Male Bird." *Journ. Dept. Agric. S. Australia.* Vol. XXII., No. 6. January 1919. Pp. 459-464.

As the result of observations made in 1911, the author concluded that "the influence of the male bird extends strongly for a fortnight, and that at least three weeks should elapse before the effect due to change of male bird can be relied upon." His experiments conducted in 1918 show that fertile eggs may be expected as the result of a single sexual act and that "the motility of the spermatozoon is so rapid that within twenty-four hours after consummation of the sexual act fertilised eggs can be expected where the hen is in a laying state."

MADSEN, T., WULFF, O., and WATABIKI, T. "The Speed of Phagocytosis" (Sur la vitesse de réaction de la phagocytose). *C. R. Soc. Biol.* Vol. LXXXII., No. 5. 1st March 1919. P. 199.

MÉTIVET, G. "Utilisation of Food after Exclusion of the Duodenum" (Note sur l'utilisation des aliments après l'exclusion du duodénum). *C. R. Soc. Biol.* Vol. LXXXII., No. 6. 8th March 1919. Pp. 222-224.

The utilisation of fats and albuminoids is not affected by exclusion of the duodenum.

REGNAULT, F. "The Lymphatic Temperament in Man and Animals" (Le tempérament lymphatique chez l'homme et les animaux). *Rev. Path. Comp.* Vol. XIX., No. 153. February 1919. Pp. 19 (49)-22 (52).

POULTRY DISEASES.

HADLEY, P. "The Diagnosis of Fowl Cholera and Fowl Typhoid Infections in Domestic Birds." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 2. May 1919. Pp. 186-192. 2 Tables.

"It is the purpose of this paper to present the essential differences between the two poultry diseases, fowl typhoid and fowl cholera, with special reference to (1) the nature of the disease process and pathological alterations in the organs and tissues, (2) the causative agents (*B. gallinarum* and *B. avisepticus*) and their biochemical features, (3) their toxicity or virulence, (4) their serological reactions, and (5) their immunological reactions. Also the

differential characteristics of *B. gallinarum*, *Bact. pullorum A* and *Bact. pullorum B* are presented. In addition, there are mentioned three new species of bacteria pathogenic for birds (*Bact. jeffersonii*, *Bact. rettgeri* and *Bact. pfaffi*) and their distinctive biochemical features described."

SCHERAGO, M., and BENSON, J. P. "Experiments on the Intradermal Test for *Bacterium pullorum*." *Cornell Veterinarian*. Vol. IX., No. 2. April 1919. Pp. 111-119. 2 Tables.

"The results of this experiment show that the intradermal test was so inconstant as to be worthless so far as a diagnostic agent for *Bacterium pullorum* infection in adult fowls is concerned. . . . In comparison with the agglutination test, which has proved itself to be the most reliable one so far, the intradermal test has given contrary results. . . . The experiment has proven, also, that a previous injection of the intradermal fluid has caused at least 85 per cent. of the birds retested to react to the agglutination test regardless of their reactions in the original test."

SEROLOGY AND IMMUNOLOGY.

BACHMANN, A. "The Presence of Specific Substances in the Leucocytes of Immunised Animals" (Inmunidad anti-infecciosa. Presencia de sustancias específicas en los leucocitos de animales inmunizados). *Revista Zootecnica*. Vol. VI., No. 66. March 1919. Pp. 404-417.

BOND, C. J. "The Physical State of the Blood Serum in Relation to its Agglutinin and Antibody Content: The Effect of Friction and Pressure." *Brit. Med. Journ.* No. 3050. 14th June 1919. Pp. 729-733. 16 Figures.

"The above observations seem to show that by submitting blood serum and other body fluids to a mechanical process, which includes friction combined with pressure, physical changes can be brought about in these fluids which throw some light on the condition in which haemagglutinins, bacterial agglutinins, complement, complement deviating substances, and antibodies exist in the blood serum. They suggest that the blood serum and the body fluids, the secretions and the excretions, form a graded series with the blood serum at one end, and the excretions, such as the urine, at the other."

HASLAM, T. P., and LUMB, J. W. "Blackleg Toxin." *Journ. Inf. Dis.* Vol. XXIV., No. 4. April 1919. Pp. 362-365.

"Recently Nitta, Eichhorn, and Kelser (see this *Review*, 1917, I. 405; 1918, II. 443; and 1919, III. 63) have made claims in regard to the production of toxin in cultures of blackleg, the latter holding that the immunising properties of the filtrate are in direct relation to its toxicity, and that

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non-toxic filtrates have no value as immunising agents. As no data are furnished by these authors in regard to the purity and identity of the strains used, their publications cannot be considered authoritative. . . . Blackleg filtrates made by four different laboratories were non-toxic to guinea-pigs, and possessed marked immunising properties in calves. The experiments indicate that the immunising power of blackleg filtrates is not dependent on toxicity."

IZCARA, D. G. "The Prophylactic and Curative Value of Sera and Vaccines in Veterinary Medicine" (*Valor profiláctico y curativo de los sueros y vacunas en veterinaria*). *Revista Hig. y Sanidad Pecuarias* Vol. IX., No. 5. May 1919. Pp. 260-283.

MURRAY, C. "Immunization Products and Indications for their Use." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 1. April 1919. Pp. 68-76.

A short consideration of the general principles of the subject.

QUARELLA, B., and VENTURELLI, G. "The Antitryptic Power of Blood Serum" (*Ricerche sul potere antitriptico del siero sanguigno*). *Biochim. e Terap. Sper.* Vol. VI., No. 1. January 1919. Pp. 9-24.

RONCHÈSE, A. D. "The Conservation of Activity of the Complement" (*Procédé de conservation de l'activité du complément*). *C. R. Soc. Biol.* Vol. LXXXII., No. 5. 1st March 1919. Pp. 193-195.

ROUS, P., ROBERTSON, O. H., and OLIVER, J. "Experiments on the Production of Specific Antisera for Infections of Unknown Cause. II. The Production of a Serum effective against the Agent causing a Chicken Sarcoma." *Journ. Expt. Med.* Vol. XXIX., No. 3. March 1919. Pp. 305-320. 5 Figures.

"By the method of selective absorption with tissue, protective serum antibodies have been demonstrated in the case of an infection of unknown cause; namely, a chicken sarcoma transmitted by a filterable agent. Geese were repeatedly injected with the finely ground sarcoma, and with blood from fowls moribund of it; and their sera acquired the power to prevent the tumour-producing agent from causing growths. That this was not due to antibodies elicited by the chicken tissue as such was shown by exhaustion of the goose sera with chicken red cells, a step which has not the least effect on the tumour-preventing power, and also by experiments with rabbits immunised as were the geese. These animals developed strong chicken antibodies in their sera which failed nevertheless to affect the tumour-producing agent."

WRIGHT, A. E. "A Lecture on the Lessons of the War and on some New Prospects in the Field of Therapeutic Immunisation." *Lancet.* Vol. CXCVI., No. 4987. 29th March 1918. Pp. 489-501. 11 Figures.

Failure in vaccine therapy occurs under three conditions. First, when the infection, as in phthisis, is producing constitutional disturbance with recurring pyrexia; secondly, when there are unopened abscesses, or sloughing wounds with corrupt discharges; and thirdly, in long-standing infections. A number of new terms are suggested. *Kata-phylaxis* indicates the transport of leucocytes and antibodies to the site of infection. *Epi-phylaxis* refers to reinforcement, as by leucocytosis. The old term of *negative phase* is replaced by *apo-phylactic phase*. An *ec-phylactic region* is one in which the guardian elements of the blood have been rendered impotent, or, as the case may be, have been excluded. Every living bacterial colony must become the centre of an ec-phylactic sphere.

The paper is not susceptible of satisfactory abstraction, and should be read in the original.

SURGERY.

BAGSHAW, T. V. "Notes on an Operation on 'Quittor' in the Horse." *Vet. Journ.* Vol. LXXV., No. 3. March 1919. Pp. 83-88. 3 Figures.

The author does not claim that the operation is original, but he has not seen it described in the literature on the subject. The details of the operation cannot be adequately described in an abstract, and the figures are necessary for the proper understanding of the operation. The article should be consulted in the original. The advantages claimed are: (1) No interference with the hoof or coronary band. (2) Simplicity in after-treatment. (3) Quickness in operation.

BROWNING, C. H., and GULBRANSEN, R. "The Testing of Antiseptics in Relation to their Use in Wound Treatment." *Journ. Hyg.* Vol. XVIII., No. 1. April 1919. Pp. 33-45. 5 Tables.

Extended investigations have confirmed the original values of flavines and brilliant green.

CHAUSSÉE. "An Electric Probe for the Detection of Metallic Foreign Bodies in Wounds" (Sonde électrique pour la recherche des projectiles de guerre). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 327. March 1919. Pp. 136-138.

Herein is described a simple mechanism for the detection of metallic bodies. The probe consists of a lead tube containing two fine insulated copper wires. The rest of the mechanism consists of an electric bell and a battery.

CINOTTI, F. "Tracheostomy" (La traquestomia). *Revista Soc. Med. Vet.* Vol. III., No. 14. December 1918. Pp. 499-503. 2 Figures.

Already abstracted from another source (*Review*, 1919, III. 70).

CURASSON. "Epizootic Inflammation of the Interdigital Sinus of Sheep" (Inflammation du sinus biflexe à forme épizootique chez le mouton). *Rec. Méd. Vét.* Vol XCV., No. 9. 15th May 1919. Pp. 268-273.

EVE, H. B. "B.I.P.P. Treatment of Wounds." *Vet. Journ.* Vol. LXXV., No. 5. May 1919. P. 174.

FITCH, C. P., BOYD, W. L., and BILLINGS, W. A. "The Use of Dichloramin-T in Veterinary Practice." *Cornell Veterinarian.* Vol. VIII., No. 4. October 1918. Pp. 292-296.

"It (dichloramin-T) will not work miracles. It does not relieve the practitioner from the application of the proper surgical treatment of infections and wounds. It is, however, a very valuable agent for the veterinary practitioner in his treatment of wounds and suppurations." The writers use a 5 per cent. solution.

FRANC. "Shoes for the Treatment of Contracted Foot" (Les "fers incomplets" dans le traitement de l'encastelure). *Rec. Méd. Vét.* Vol. XCV., No. 7. 15th April 1919. Pp. 207-217. 2 Figures.

— "Catarrhal Conjunctivitis in Horses" (Conjonctivite catarrhale à caractère épizootique). *Rec. Méd. Vét.* Vol. XCV., No. 9. 15th May 1919. Pp. 273-275.

GANNETT, R. W. "Clinical Observations on Foot Diseases of the Horse." *Cornell Veterinarian.* Vol. IX., No. 1. January 1919. Pp. 22-27.

"Gangrenous dermatitis or sloughing of the skin of the pastern and coronet in our experience causes fully 75 per cent. of all quittors. Next in importance as causative factors I would place corns, pododermatitis, injuries to the quarter and quarter cracks." After complete removal of the cartilage in cases of "quittor," the author applies a final dressing to every part of the wound of a 5 per cent. solution of dichloramin-T.

GIBSON, C. L. "The Advantages of Picric Acid over Tincture of Iodine for Disinfection of Skin." *Ann. Surg.* Vol. LXIX., No. 2. February 1919. P. 127.

A solution of picric acid has all the advantages and none of the drawbacks of tincture of iodine, and is also very cheap.

GOLDBERG, S. A. "Foreign Bodies in the Tissues, with a Report of Six Cases." *Report New York State Vet. Coll., 1917-18.* 1919. Pp. 128-137. 2 Plates (5 Figures). *Cornell Veterinarian.* Vol. VIII, No. 4. October 1918. Pp. 257-265. 2 Plates (5 Figures).

The cases reported are:—(1) Two pins perforating the reticulum and diaphragm of a cow; (2) traumatic pericarditis in a cow; (3) perforation of the rib of a cow by a piece of umbrella wire; (4) a piece of wood embedded in the eyelid of a horse; (5) woody tissue in the wall of the abomasum of a cow; and (6) ulcer of the tongue of a dog caused by particles of wood. The last three cases are those of microscopic foreign bodies.

GUILLAUME, A., and BITTNER, G. "Specific Serotherapy in Wounds and Pyogenic Infections" (Sérothérapie spécifique des plaies et infections pyogènes). *Rev Gén Méd. Vét.* Vol. XXIII, No. 327. March 1919. Pp. 113-136.

HAMOIR, J. "Observations on Idiopathic Empyema of the Air-Sinuses." *Vet. News.* Vol. XVI, No. 786. 25th January 1919. Pp. 29-32. *Ibid.* No. 790. 22nd February 1919. Pp. 63-65. *Ibid.* No. 791. 1st March 1919. Pp. 73-75. *Ibid.* No. 795. 29th March 1919. Pp. 105-108. *Ibid.* No. 796. 5th April 1919. Pp. 113-114. (Translation of an article that appeared in *Rec. Méd. Vét.* Vol. XCIV., No. 20. 30th October 1918. *Bull. Soc. Centr. Méd. Vét.* 10th October 1918. Pp. 404-436.)

LENEVEU, G. "The Aseptic Ablation of the Complementary Cartilage of the Third Phalanx (Lateral Cartilage)" (De l'ablation aseptique du fibro-cartilage complémentaire de l'os pied par la voie cutanée : Technique). *Rev. Gén. Méd. Vét.* Vol. XXVIII, No. 328. April 1919. Pp. 177-181.

LEWIS, P. A., and NEWCOMER, H. S. "The Functional Value of Newly-Formed Connective Tissue." *Journ. Exp. Med.* Vol. XXIX., No. 4. April 1919. Pp. 369-378. 4 Tables.

"It has been found that the functional value of connective tissue formed in response to traumatism as represented by its tensile strength varies widely in different animals. It is suggested that the method may find application in the study of extraneous influences which may affect wound healing either through local or systematic application. It has been determined that there is no parallelism between an active connective tissue response to traumatism and natural resistance to inoculation tuberculosis in the rabbit."

MURPHY, H. S. "A Method of Operating Scrotal Hernia in Boar Pigs to Save the Testicle." *Journ. Amer. Vet. Med. Assoc.* Vol. LXXV., No. 1. April 1919. Pp. 62-64.

PEATT, E. S. W. "'Bipp' Treatment." *Vet. Journ.* Vol. LXXV., No. 5. May 1919. Pp. 163-173.

RESPALDIZA Y UGARTE, E. "A Rational Method of Castration of the Horse" (Un nuevo método de castracion del caballo más racional que los actuales). *Revista Hig. y Sanidad Pecuarias.* Vol. IX., No. 5. May 1919. Pp. 291-295.

The author pleads for a method of castration by ligature or section of the ductus deferens, without removal of the testis.

ROBSON, J. "Bacterial Infection of Wounds in France." *Vet. Record.* Vol. XXXI., No. 1602. 22nd March 1919. Pp. 325-327.

SINCLAIR, J. M. "Obstruction in the Sheath of the Ox." *Rhodesia Agric. Journ.* Vol. XVI., No. 1. February 1919. Pp. 37-38.

TURNER, A. J. "Scarlet Red Powder as a Tissue Stimulant." *Lancet.* Vol. CXCVI., No. 4986 22nd March 1919. P. 463.

"That toluol-azo-tolulol-azo- β naphthol (scarlet red) has a powerful effect on stimulating the growth of granulation tissue and epithelium is well known." The author of this note uses 2 grains to the ounce of vaselin, applied daily. "Where it is desired merely to hasten the growth of epithelium a very successful method is to apply the ointment for two days, and then apply a daily hot fomentation for four days, these alternations to be repeated as long as necessary."

WAITE, R. H. "How to Caponize." *Bull. No. 226.* Agric. Exp. Station, Maryland State Coll. Agric. February 1919. Pp. 185-192. 22 Figures.

TERATOLOGY.

ROBERTS, H. I. "Schistocermus Fissiventralis." *Vet. News.* Vol. XVI., No. 795. 29th March 1919. P. 104.

The specimen was an equine foetus.

TOXICOLOGY.

BAILLY. "Wild Thyme Poisoning in Two Mules" (Empoisonnement de deux mulots par le thym serpolet). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 326. February 1919. Pp. 75-76.

CHATELAIN. "The Effect of 'Gas' on Two Horses" (Relation clinique sur deux chevaux yperités au cours de bombardements par obus toxiques). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 328. April 1919. Pp. 185-190.

DOWELL, C. T. "Cyanogenesis in *Andropogon sorghum*." *Journ. Agric. Res.* Vol. XVI., No. 7. 17th February 1919. Pp. 175-181. 1 Table.

SACKETT, W. G. "The Connection of Milksickness with the Poisonous Qualities of White Snakeroot (*Eupatorium urticæfolium*)."
Journ. Inf. Dis. Vol. XXIV., No. 3. March 1919. Pp. 231-259.

SIMMONS, J. S., and VON GLAHM, W. C. "Effect of 'Ground Glass' on the Gastro-intestinal Tract of Dogs." *Amer. Journ. Vet. Med.* Vol. XIV., No. 5. May 1919. Pp. 225-227. (From the *Journ. Amer. Med. Assoc.* 28th December 1918.)

"The ingestion of ground or powdered glass has no toxic effect and produces no lesion, either gross or microscopic, on the gastro-intestinal tract of dogs."

TUBERCULOSIS.

GRANUCCI, L. "Passive Anaphylaxis for the Recognition of Tuberculous Meat" (L'anafilassi passiva pel riconoscimento delle carni tubercolotiche). *La Clinica Vet.* Vol. XLII., No. 4. 28th February 1919. Pp. 115-126.

JORGENSEN, G. E. "Some Experience obtained from Contact with Tuberculosis." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 7. March 1919. Pp. 751-754.

Contains clinical notes of cases of bovine and avian tuberculosis.

LOTHE, H. "The Federal Accredited Herd Method of Controlling Tuberculosis in Cattle and the Practising Veterinarian." *Amer. Journ. Vet. Med.* Vol. XIV., No. 4. April 1919. Pp. 172-176.

Shows in what manner the Bureau of Animal Industry's method of eradication of tuberculosis by means of the "accredited herd" method will affect the general practitioner. "It is derogatory to veterinary development in general by discriminating against the practitioner. General adoption of the plan will discourage able men from entering the profession by lowering the possibilities of a good income from practice. The plan, to all intents and purposes, amounts to confiscation."

VOLPINO, G. "Experimental Study on the Therapy of Tuberculosis" (Etude expérimentale sur la thérapie de la tuberculose). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 3. March 1919. Pp. 191-196.

WAY, C., and HALL, A. G. "The Tuberculin Test and the Seven-Day Re-Test." *Cornell Veterinarian.* Vol. IX., No. 1. January 1919. Pp. 37-41.

VETERINARY REVIEW.

ABSTRACTS.

CLINICAL.

A CASE OF VERMINOUS COLIC (Sur un cas de coliques vermineuses).

BOUCHET. *Rec. Méd. Vét.*, Paris. Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 240-241.

The subject of this note was an entire Belgian horse, seven years old, that had suffered from recurring attacks of colic. The animal when first seen was in good condition, without excess of fat, and able to accomplish hard work with ease.

The last attack of colic, unlike those that had preceded it, did not yield to the usual method of treatment. On post-mortem examination the small intestine was found to be markedly congested, more particularly in the middle portion. In places the congestion was of such a degree as to be haemorrhagic. On cutting open the intestine a mass of ascarids, mixed with blood-stained mucus, escaped. Further longitudinal incisions revealed a considerable quantity of parasites, about two hundred being counted, and doubtless many escaped detection.

To test the hypothesis that the colic had been due to the presence of ascarids, the other horses in the same stable, in which colic had not been observed for a long time, were subjected to vermifuge treatment (tartar emetic). From one only were ascarids passed. The author, therefore, considers it probable that the subject of this note was in a special state of receptivity towards ascarids, and that it is logical to conclude that the recurrent colic and ultimate death of the horse were directly due to the presence of ascarids in large numbers.

A DENTAL ANOMALY THAT LED TO FATAL HÆMORRHAGE IN A HORSE

(Anomalie dentaire ayant entraîné la mort). BOUCHET.

Rec. Méd. Vét., Paris. Vol. XCV., No. 11. 15th June 1919. Pp. 320-322.

The author was called to attend a twenty-year-old horse in which there was haemorrhage from the mouth. When first seen by Bouchet,

the animal was in good condition, and very vigorous. The pulse was good and regular, and the mucous membranes normal in appearance. An examination of the mouth revealed an accumulation of blood. The teeth were somewhat irregular, with numerous asperities along both edges. This led the author to conclude that the tongue had been injured by the sharp teeth, and that the haemorrhage would cease if the lower jaw was rendered immobile. This was done by means of a bandage, and the head was tied high up to the rack. An injection of adrenalin completed the immediate treatment. The case caused no immediate alarm.

Next day, however, the horse was discovered in a distinctly alarming condition. The manger contained from 15 to 18 litres of blood-stained fluid in which were a number of large clots. The pulse of the patient was very feeble, the mucous membranes extremely pale, the respiration accelerated, and the general condition pre-agonal. The horse was slaughtered, and did not yield more than 4 or 5 litres of blood.

On post-mortem examination it was discovered that there were seven cheek-teeth on each side of the mandible. The last tooth, not being opposed by a corresponding tooth in the upper jaw, had worn to an extremely sharp edge. This had gradually penetrated the mucous membrane and bone, and had finally opened the palatine canal on both sides of the head. On the right side the wall of the greater palatine artery had been ulcerated, and from this vessel the fatal haemorrhage had taken place. If the horse had lived a little time longer, the same accident would have taken place on the left side.

CASES OF HEART DISEASE (Contribution à l'étude de la pathologie cardiaque). G. BOUCHET. *Rec. Méd. Vét.*, Paris. Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 259-263.

The two cases herein discussed are described by the author mainly for the reason that the symptoms during life did not permit of an accurate diagnosis of the lesions found after death.

The first case is that of a five-year-old gelding seen by the author three years before the fatal illness. At first the main symptom was loss of appetite. The temperature was somewhat higher than normal, but the respirations were unaltered. Later the pulse became weak, the heart-beat enfeebled, and a jugular pulsation made its appearance. Respiration became accelerated, dyspnoea was induced by slight exertion, and the pulse was very rapid. Though there was almost complete loss of appetite, emaciation was not pronounced. Under treatment with digitalis, the animal recovered completely in three months. Three

years later, the horse was slaughtered because of hæmoglobinuria, and a post-mortem examination was made. The heart itself was perfectly normal, but there was evidence of a former pericarditis in the shape of tufts of villous tissue, sometimes irregularly scattered, sometimes in islets, principally on the visceral pericardium.

The second case was that of a mare, three years old, that had suffered from "strangles." Suddenly and without apparent cause the mare lost condition; the limbs became œdematosus, and small nodules, with agglutination of the hairs, appeared on the metacarpal and metatarsal regions. The general condition of the animal remained good for some time, the temperature was only slightly raised above the normal, but the pulse was slow and rather feeble, and the conjunctiva slightly paler than normal. The appetite was good. Eight days later there was marked change. Emaciation was considerable, the coat was staring, and the appetite diminished. Respirations were 18, temperature 38.5°, the pulse rather soft and weak, and the conjunctiva paler. Large lesions made their appearance on the tongue and inside the cheeks. The mucous membrane was lost in patches, and the underlying tissue bled on slight contact. In places the membrane was raised by the accumulation of blood beneath it. (Edema of the limbs persisted—as it did throughout the entire illness. Quinine, strychnine, and digitalis were administered without effect. Emaciation gradually increased and the visible mucous membranes became paler. The ulcers in the mouth healed, and were succeeded by others. The heart sounds were always indistinct, but could be heard better on the right than on the left side. The pulse became more feeble, but there was no pulsation in the jugular vein.

One morning, lameness of the right fore limb was observed, and the elbow joint of that limb was hot and painful. Finally, the horse was destroyed.

Post-mortem examination disclosed marked lesion of the tricuspid valve, which was the site of extensive vegetations that involved the entire valve. The elbow joint contained a notable amount of synovia, and there was suffusion of the articular surfaces, with vividly injected newly formed synovial fringes.

GENERALISED CANCER OF THE LUNG IN A COW (Lymphangite cancéreuse généralisée du poumon chez la bête bovine). L. RULOT. *L'Echo Vet.*, Liège. Vol. XLVIII., No. 1. May 1919. Pp. 19-21.

This clinical note is of interest in connection with the literature on cancer in veterinary medicine. It relates to a case in which the morbid anatomy differed sharply from that in other forms of the disease. The subject was a cow, ten years of age, that had calved three weeks

previously. The proprietor called Rulot in because of marked agalaxy and rapid emaciation.

According to the previous history, the cow had given birth to seven calves and was a very good milker. There had been no cough, and the general health of the animal had been excellent. Tuberculosis was only very occasionally met with on the farm.

On examination, the general condition of the cow was found to be bad; the appetite was capricious; the animal was dejected; the dorso-lumbar reflex was absent; temperature 38·5° C.; pulse feeble; respiration rapid; mucous membranes cyanosed, and cough frequent. There were moist rales with sibilance over the whole chest, and percussion revealed areas of dulness and semi-dulness. The mammary glands were large and hard, and the retro-mammary lymph glands were enlarged. The milk, scanty in amount, appeared normal in character. The condition being regarded as serious, the cow was slaughtered.

On post-mortem examination, abundance of lemon-yellow effusion was discovered in the thoracic cavity. The exterior of the lungs recalled emphysema, but the interlobular septa were visible as broad pale yellow bands. Section in the region of the hilus presented a noteworthy appearance. Here there was a sclerosed mass, difficult to cut, that spread into the lungs and mediastinum. Extending into the deep part of the lung were numerous broad trabeculae, dissecting up the pulmonary tissue, and producing an irregular mosaic appearance of the organ. The bronchial and mediastinal glands were enlarged and indurated, but did not present any appearance of tuberculosis. The lymph glands in the sublumbar region were similarly affected. The liver, kidneys, and spleen were apparently the seats of pathological processes of a like nature.

The cancerous character of the various lesions was recognised on microscopic examination.

PRIMARY TUMOUR OF THE PERITONEUM IN A DOG (Su di un caso di tumore primitivo del peritoneo nel cane). L. SANI. *Il Nuovo Ercolani*, Turin. Vol. XXIV., No. 6. 31st March 1919. Pp. 65-71. *Ibid.* Nos. 7-8. 15th-30th April 1919. Pp. 89-93. *Ibid.* No. 9. 15th May 1919. Pp. 97-100. *Ibid.* No. 10. 31st May 1919. Pp. 116-119. 2 Figures.

Sani gives an account of a very careful and complete study of a case of multiple primary tumour of the peritoneum of a dog about nine years old. The present communication deals with the clinical and gross post-mortem features of the case. In a later paper he is to describe the histological characters of the tumour growths.

According to the previous history of the case, the animal had always

been of a petulant and irritable temperament, and had shown evidence of perverted appetite. The dog was habitually constive, and passed abundant urine. Some motor disturbance had been noted in the gait of the hind limbs. At one time there had been an attack of diffuse, pustular eczema, and a suspicious new growth in the region of the pharynx had been treated by another surgeon.

For about a month before the dog was brought to the hospital, the appetite had been less than usual, there had been irregularity of the movements of the bowels and urination, and increased petulance and a desire for solitude had been evinced. Appetite continued to diminish and thirst increased. The animal became weak and prostrate, and emitted groans from time to time. Defaecation became increasingly difficult, the urine was small in amount but frequently voided, and there was frequent vomiting.

When admitted to hospital the dog was a veritable skeleton, the skin was dry and had lost its normal looseness, the visible mucous membranes were pallid, and there was evident weakness. The rectal temperature was normal. The abdomen was enlarged a good third above the normal size; and, when the animal was standing, the distension gradually increased from above to below, attaining its maximum in the lower third of the abdomen. The flanks were hollow, and the transverse processes of the lumbar vertebrae and the last rib were prominent. On changing the posture of the animal, the form of the abdomen altered. There was no œdema of any part of the body. On palpation of the abdomen the presence of fluid could be detected; and percussion over the lower part of the abdomen elicited a dull note when the dog was standing. The pulse was weak, frequent, fast, and irregular; and the number of respirations was greater than normal.

About 3 litres of slightly reddish fluid was withdrawn from the abdomen. The fluid was transparent, odourless, alkaline, had a specific gravity of 1018, and contained 4 per cent. of albumin. After standing for twenty-four hours there was a dark red sediment. Microscopic examination revealed erythrocytes and polymorphonuclear leucocytes, a few lymphocytes, and some endothelial cells. The urine contained 0·5 per cent. of albumin.

The fluid re-accumulated in the abdomen in even greater amount than before. Again it was drawn off, only to accumulate once more. Some degree of paresis of the hind limbs developed. Periods of constipation alternated with diarrhoea, and urine was voided more frequently than before.

An examination of the blood was made three times in the course of the illness, and showed a notable degree of anaemia accompanied by

leucocytosis. The leucocytosis, however, tended to diminish, more particularly in respect of the eosinophiles.

The dog died, and a post-mortem examination revealed great emaciation. The abdomen contained 5 litres of fluid similar to that which had been withdrawn during life. The whole peritoneum was studded with rounded nodules varying in size from a millet seed to a hazel nut. The greater number of these were discrete, but some were confluent. Their surface was smooth, and, mostly, creamy-white in colour. Some, however, were the colour of dark red wine. Most of them had a firm, even hard, consistence; but others, of a red colour, were softer. The abdominal viscera themselves were, generally speaking, more or less normal; though there was enlargement of the liver and kidneys. The pleura and the thoracic organs were normal.

DIETETICS.

THE INFLUENCE OF BARLEY ON THE MILK SECRETION OF COWS. F. W. WOLL and E. C. VOORHIES. *Bull. No. 305.* College of Agric. Exp. Station, Univ. California. February 1919. Pp. 325-334. 4 Tables.

There is a certain prejudice against the use of barley for milch cows among some dairy farmers who believe that it has a tendency to dry up the cows. Some experiments were therefore conducted to study the influence of this cereal on the milk secretion. Barley was fed as the sole concentrate to a good type of dairy cow for several lactation periods, in addition to alfalfa hay or alfalfa and silage. While she was offered and ate as much as 15 lbs. of barley daily for a few weeks during one lactation period, it was found that 10 lbs. per day was ordinarily her limit, and this amount was rarely exceeded even at the flush of her production, when she produced over 2 lbs. of butter fat daily. There is nothing in the results obtained in the experiment with this cow that would indicate that an exclusive or even a heavy long-continued feeding of barley has any deleterious influence on the milk secretion. On the contrary, the exclusive barley feeding was beneficial in every respect. The findings were confirmed by an experiment on two other cows. Several brief-period feeding trials also support the opinion here expressed that barley is an excellent food for milch cows. The explanation of the belief of some farmers that the feeding of barley tends to dry up milch cows is probably to be sought in the fact that such a result has frequently come when cows have been turned out on barley stubble, or fed on coarse barley hay only, with no additional feed.

(R. G. L.)

QUANTITY AND COMPOSITION OF EWES' MILK: ITS RELATION TO THE GROWTH OF LAMBS. R. E. NEIDIG and E. J. IDDINGS. *Journ. Agric. Res.*, Washington, D.C. Vol. XVII., No. 1. 15th April 1919. Pp. 19-32. 6 Tables.

Observations had previously been made upon the rate of growth of lambs from five breeds of ewes, and it was found that some breeds made a decided gain over others in the same period of time. As the rate of growth of lambs is of more than ordinary interest, an effort is being made to ascertain the relation of the quantity and composition of ewes' milk of each breed to the growth of the lambs. The milk of ewes of different breeds has been found to vary in both these respects. In this experiment three ewes were chosen that showed characteristics of the average ewe of the particular breed, six breeds being used.

It was found that there is a great variability in the percentages of the constituents of the milk, not only among the different breeds, but also during the lactation period of the individual. The analytical results are given in the various tables.

The most constant constituent in the milk of all breeds examined appears to be lactose, while fat seems to be the most variable. The difference in the percentage of fat is very marked. (R. G. L.)

THE RANCIDITY OF PALM KERNEL AND OTHER FEEDING CAKES. J. R. FURLONG. *Journ. Agric. Sci.*, Washington, D.C. Vol. IX., No. 2. April 1919. Pp. 137-142.

With the great increase in the use of palm-kernel cake in this country, attention has been drawn to the rancidity which this cake is liable to develop under certain conditions. Calder, having shown that rancidity in the cake can be developed under sterile conditions, concluded that the action was due to the presence of a lipase. The terms "acidity" and "rancidity" are often confused. Although rancidity stands in close relationship to acidity, and invariably accompanies a high acidity in fats and oils, the terms are not synonymous. Rancidity has been defined (Lewkowitsch) as the production of a disagreeable smell and acrid taste, due to the oxidation of the free fatty acids by the simultaneous action of oxygen and light. Lewkowitsch also stated that rancidity does not appear until free fatty acids are produced. Considerable doubt exists as to the nature of the oxidation products to which the rancid smell and acrid taste are due, and there is no method of estimating the extent to which rancidity has been produced in any particular case, though the acidity is an indication of the initial phase of the change. The degree of rancidity is influenced by the nature of the fatty acids present, that is to say, the ease with which they form

oxidation products, and the odour and taste of the latter. In these experiments, carried out at the Imperial Institute, the amount of acidity developed under certain conditions in palm kernels, and in cake and meal made from them, in comparison with other common feeding cakes, has been determined, and the nature of the action investigated. It is concluded that palm kernels and palm-kernel cake and meal contain a lipase, which in the presence of moisture and warmth acts upon the oil present, liberating fatty acids, of which the volatile members have a strong sweat-like odour, and a very small amount of these acids is sufficient to impart to the cake a peculiar odour. This change does not occur if the cake is kept dry, a condition which is necessary to the preservation of all feeding cakes. Freshly prepared palm-kernel cake has a characteristic smell which is probably due to a trace of these acids produced during manufacture. Palm-kernel cake does not decompose more readily than cotton-seed, linseed and ground-nut cakes, these latter developing more acidity under similar conditions. These cakes differ from palm-kernel cake in not yielding volatile fatty acids on decomposition.

(R. G. L.)

HYGIENE AND PREVENTIVE MEDICINE.

THE EXAMINATION OF MILK.

1. "A propos de la recherche des leucocytes dans le lait." H. KUFFERATH. *Ann. Inst. Pasteur*, Paris. Vol. XXXIII., No. 6. June 1919. Pp. 420-424. 1 Figure.
2. "Le control bactériologique et hygiénique des laits. Méthodes employées et appréciation des résultats." H. KUFFERATH. *Ibid.* No. 7. July 1919. Pp. 462-483.

1. In Kufferath's first paper the defects of the Trommsdorff leucocyte tube are pointed out. The tubes are too fragile and break easily in the narrow part; they are expensive; and they necessitate a special centrifuge, in which only four tubes can be used at a time. Furthermore, the lumen of the narrow part of the tube, where the deposit accumulates, is very small, and it is not easy to remove the deposit in consequence. The small lumen also renders cleaning difficult.

As a means of removing these drawbacks the Laboratoire Intercommunal of Brussels now uses a larger tube, which will contain 20 c.c. of milk instead of 10 c.c. The narrow, lower part of the tube is graduated into two parts, corresponding to 1 and 2 per 1000 of the milk. The wide portion of the tube is graduated for 5, 10, 15, and 20 c.c.; and it is continued for 6 or 7 centimetres beyond the 20-c.c. mark, in

order that the tube may be inclined without danger of spilling the milk. A large-model electric Gerber centrifuge, containing six tubes, is used. If a sample of milk contains an abnormal leucocytic content (over 1 per 1000, for example), the deposit is examined microscopically.

2. In his second paper Kufferath describes the methods employed in the examination of milk at the Intercommunal Laboratory at Brussels, and states the details of the method of scoring. A maximum of 150 points is given for all kinds of milk, and samples are graded as follows:—

Grade.	Sterilised and Pasteurised Milk.	Aseptic Raw Milk.	Ordinary Milk.
Maximum	150.	150.	150.
Favourable analysis	More than 130.	More than 130.	More than 115.
Medium analysis	120 to 130.	115 to 130.	100 to 115.
Unfavourable analysis	Less than 120.	Less than 115.	Less than 100.

The points are calculated in the following manner:—

CULTIVATION ON AGAR AT 37° C. AFTER THREE DAYS. Maximum = 30.

A. For sterilised and pasteurised milks.

0 to	100 organisms per c.c.	.	.	.	.	30 points.
100 to	200 "	"	.	.	.	28 "
200 to	500 "	"	.	.	.	27 "
500 to	1,000 "	"	.	.	.	25 "
1,000 to	5,000 "	"	.	.	.	21 "
5,000 to	30,000 "	"	.	.	.	18 "
30,000 to	50,000 "	"	.	.	.	15 "
Over 50,000	"	"	.	.	.	0 "

B. For raw aseptic milk.

0 to	1,000 organisms per c.c.	.	.	.	.	30 points.
1,000 to	3,000 "	"	.	.	.	28 "
3,000 to	10,000 "	"	.	.	.	26 "
10,000 to	25,000 "	"	.	.	.	24 "
25,000 to	40,000 "	"	.	.	.	22 "
40,000 to	50,000 "	"	.	.	.	20 "
50,000 to	100,000 "	"	.	.	.	5 "
Over 100,000	"	"	.	.	.	0 "

C. For ordinary milk.

Less than 10,000	organisms per c.c.	.	.	.	.	30 points.
10,000 to	50,000 "	"	.	.	.	27 "
50,000 to	100,000 "	"	.	.	.	25 "
100,000 to	500,000 "	"	.	.	.	20 "
500,000 to	2,000,000 "	"	.	.	.	15 "
2,000,000 to	10,000,000 "	"	.	.	.	10 "
Over 10,000,000	"	"	.	.	.	0 "

EXAMINATION FOR LEUCOCYTES. Maximum=30.

For all kinds of milk.

From 0·0 to 0·5 per 1000	.	.	.	.	.	30 points.
From 0·6 to 0·9 "	.	.	.	.	.	25 "
From 1·0 to 1·5 "	.	.	.	.	.	15 "
From 1·6 to 2·0 "	.	.	.	.	.	2 "
Over 2·0 "	.	.	.	.	.	0 "

If there is blood in the deposit, 20 points are deducted from the general total.

CATALASE TEST. Maximum=30.

A. For raw ascitic and ordinary milks.

From 0·0 to 3·5 c.c. in two hours	.	.	.	.	.	30 points.
From 3·5 to 4·0 "	.	.	.	.	.	15 "
From 4·0 to 5·0 "	.	.	.	.	.	5 "
Over 5·0 "	.	.	.	.	.	0 "

B. For sterilised and pasteurised milks.

0·0 c.c. in two hours	.	.	.	.	.	30 points.
From 0·0 to 2·0 c.c. in two hours	.	.	.	.	.	15 "
Over 2·0 c.c.	"	.	.	.	.	0 "

SEARCH FOR *B. COLI* AND PATHOGENIC ORGANISMS. Maximum=30.*For all kinds of milk.*

Absence of <i>B. coli</i>	.	.	.	.	.	30 points.
Presence of <i>B. coli</i> in large numbers	.	.	.	.	.	0 "
Presence of <i>B. coli</i> with absence of gas bubbles in fermentation test at 37° C.	.	.	.	.	.	15 "

If there are pathogenic organisms (streptococci, *B. tuberculosis*, etc.), 50 points are deducted from the general total.

REDUCTION TEST. Maximum=10, including 5 points for reduction and 5 points for rapidity of coagulation. The time is calculated to the moment when the reduction is complete.

For all kinds of milk.

Reduced after more than 24 hours, very good quality milk ^a	.	.	.	.	.	5 points.
" in 10 to 24 hours, good quality	.	.	.	.	.	4 "
" in 6 to 10 hours, good quality	.	.	.	.	.	3 "
" in 2 to 6 hours, medium quality	.	.	.	.	.	2 "
" in $\frac{1}{2}$ to 2 hours, bad quality	.	.	.	.	.	1 "
Reduction immediately, or in less than $\frac{1}{2}$ hour, very bad quality milk	.	.	.	.	.	0 "

If there is formation of gas bubbles, deduct 1 point.

FERMENTATION TEST at 37° C. Maximum=10, including 5 for rapidity of coagulation and 5 for the character of the clot.

A. Rapidity of coagulation. Maximum=5. For all kinds of milk.

Coagulated in	24 hours	.	.	.	.	5 points.
"	18 to 24 "	.	.	.	.	4 "
"	12 to 18 "	.	.	.	.	3 "
"	8 to 12 "	.	.	.	.	2 "
"	4 to 8 "	.	.	.	.	1 "
"	less than 4 "	.	.	.	.	0 "

B. Character of the curd. Maximum = 5. For all kinds of milk.

Homogeneous curd	5 points.
Fissured (raviné) curd	4 "
Medium (moyen) curd	3 "
Granular (dilacérée) curd	2 "

If there is the production of gas bubbles, 1 or 2 points are deducted according to the amount of gas disengaged. It often happens that, with sterilised or pasteurised milk, there is a tumultuous fermentation. This is due to spore-bearing organisms, *B. subtilis* and its varieties. Four points are allowed for such milks.

EXAMINATION OF FILMS. Maximum = 5. In all kinds of milk, 2 points are deducted if leucocytes are numerous.**A. For sterilised, pasteurised, and aseptic raw milks.**

If the bacteria are not stained, whatever the number may be	5 points.
No bacteria	5 "
Stained bacteria rare	4 "
" " few	3 "
" " fairly numerous	2 "
" " numerous, or more than three kinds, or pathogenic	0 "

B. For ordinary milk.

Bacteria few	5 points.
" fairly numerous and less than six kinds	4 "
" numerous	2 "
" numerous, more than six kinds, or pathogenic	0 "

The staining of bacteria is effected with carbolised methylene blue.

IDENTIFICATION OF ORGANISMS. Maximum = 5.**A. For sterilised and pasteurised milks.**

Spore-bearing bacteria or no organisms	5 points.
Bacteria other than spore-bearing	3 "
More than three kinds of non-spore-bearing bacteria	2 "
Moulds, yeasts, and pathogenic bacteria	0 "

B. For aseptic, raw, and ordinary milks.

More than six kinds of bacteria	4 points.
<i>B. fluorescens liquefaciens</i> , chromogenic bacteria, or numerous moulds	4 "
Two or three kinds of bacteria only, or one kind dominating	2 "
Pathogenic bacteria	0 "

DIRTINESS. Three points are deducted from the total if dirtiness is marked.

A copy of the official form on which the various points are entered is appended to the paper.

The solution of methylene blue employed in the reduction test is made according to the following formula :—

Methylene blue	1 gramme
Absolute alcohol	20 c.c.
Distilled water	29 c.c.

(R. G. L.)

INFECTIOUS DISEASES.

BACTERIUM ABORTUS INFECTION OF BULLS. J. M. BUCK, G. T. CREECH, and H. H. LADSON. *Journ. Agric. Res.*, Washington, D.C. Vol. XVII., No. 5. 15th August 1919. Pp. 239-246. 3 Plates (5 Figures).

This is a preliminary report on a series of observations relating to the agglutination test as applied to the blood serum of bulls. The pathological condition of the reproductive organs as the result of infection with *B. abortus* has also been noted. Blood samples were taken from animals as they arrived for slaughter at one of the abattoirs near Washington, D.C. Those animals giving positive or suspicious agglutination reactions were examined post mortem as carefully as abattoir conditions permitted, and the organs of the reproductive system were secured for further study. Cultural work was depended upon as a means of detecting infection. The agglutination test was applied to 325 mature bulls, and of this number 288 gave negative results. The seminal vesicles, vasa deferentia, testes, and epididymides of the thirty-seven bulls whose blood serum showed the presence of *B. abortus* agglutinins were secured. From fifteen to twenty tubes of medium were used for culturing the various organs of each bull. These demonstrated the presence of *B. abortus* in four animals, in two of which there were marked pathological lesions.

The authors summarise their conclusions in the following words:— “*Bact. abortus* infection may involve organs of the generative apparatus of bulls, producing chronic inflammatory changes. Of the generative organs, the seminal vesicles appear to furnish the most favourable site for lodgment and propagation of abortion infection. The presence of *Bact. abortus* infection in bulls appears to be more strongly indicated by relatively marked than by slight reactions to the agglutination test for this disease.”

VIBRIONIC ABORTION. Sir S. STOCKMAN. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 499-504.

This paper contains the main points brought out by the investigations of M'Fadyean and Stockman, and published in Part III. of the Report of the Departmental Committee appointed by the Board of Agriculture and Fisheries to inquire into epizootic abortion (Part III., “Abortion in Sheep,” Cd. 7156, and Appendix to Part III., Cd. 7157, 1913). The republication of the facts is of interest in view of the recent statement by Smith (“Spirilla associated with Disease of the

Fetal Membranes in Cattle," *Journ. Expt. Med.*, 1918, xxviii. 701-719; this *Review*, 1919, III. 170).

Seeing that only three outbreaks of vibrionic abortion in cows have been met with in Great Britain, it is reasonable to assume that this form of abortion mainly affects sheep, in which the disease was first discovered. Sheep also appear to be the most susceptible to experimental infection. Positive results were also obtained experimentally in the goat and the guinea-pig. Experimental infection of pregnant cows does not usually cause abortion. The disease is mainly enzootic in character, and shows no great tendency to become epizootic, as is the case in bovine abortion. Premature parturition may be preceded by a sanguineous, mucoid discharge from the vulva days, or even weeks, before abortion occurs. The fetus is usually dead and putrid, and septic metritis is not infrequently a sequel.

There are no specific lesions other than in the uterus, which may be normal externally, or there may be considerable oedema in the region of the neck. In the early stages the mucous membrane may show little except a mucoid catarrh, but later the membrane is congested, with livid patches. If the examination is made before abortion occurs, a variable amount of exudate is present between the uterine mucosa and the foetal membranes. The exudate is usually watery, reddish, and contains floccules of greyish mucus. A milky juice may be squeezed from the cotyledons, and in this, as well as in the exudate, vibrios may be discovered. A red oedematous fluid may be found in the abdominal wall and peritoneal cavity of the foetus, and vibrios are present in this fluid and in the contents of the stomachs.

The contents of the uterus, the foetus, and the foetal membranes are virulent, and experiments have shown that animals may be infected by the natural passages, the alimentary tract and the vagina, but particularly by the former. The vibrios prepared from natural material occur singly and are shaped like the letter S or a comma. Two or more may be joined end to end in the form of a spiral, but very long filaments are only found in old cultures. The vibrios are decolourised by Gram's method.

Under strictly anaerobic conditions no growth is obtained, but the vibrio does not grow in a free supply of air. In solid media the growth appears below the surface. In old cultures many of the vibrios have a granular appearance, and granules are found free in the medium. The granules can pass a Berkefeldt filter V., but no growth has been obtained from the filtrate. A first growth in ordinary media, including peptone broth, is easily obtained from natural material, such as the exudate from the uterus or fluid from the foetal stomach. Cultural details are given.

It would appear that specific agglutinins develop in the blood of infected animals, and that the agglutination test is a valuable aid to diagnosis. The test is also valuable as a means of determining whether an animal has aborted as the result of infection by the vibrio or by the bacillus of bovine abortion.

REPORT ON ULCERATIVE LYMPHANGITIS IN THE A.E.F. A. A. LEIBOLD.
Amer. Journ. Vet. Med. Vol. XIV., No. 8. August 1919.
 Pp. 387-391 and 419.

Leibold's report should be read in conjunction with that on the same subject by Strauss and Wight (*Journ. Amer. Vet. Med. Assoc.*, 1919, lv. 180-186; this *Review*, 1919, III. 281). The investigations of the writer covered approximately 225 animals suffering from various forms of lymphangitis, and a bacteriological record was kept of 165 of these horses. The organisms found in these cases were as follows :—

		P.T cent.	Cases.
Streptococci alone		72·62	117
Preisz-Nocard bacillus alone		6·06	10
Streptococci with staphylococci		6·06	10
Staphylococci alone		4·24	7
Streptococci with Preisz-Nocard bacillus		2·42	4
Staphylococci with Preisz-Nocard bacillus		0·60	1
Cryptococcus of Rivolta alone		2·42	4
No cultures obtained		7·21	12

The gross pathology of ulcerative lymphangitis as seen in the American Expeditionary Force is described in the following words :— “ Most commonly the lesion that first occurred in the early stage was a swelling, pea-sized or sometimes larger, which was usually found on the limbs, particularly on the hind limbs between the fetlock and hock joints inclusively. The swelling and tenseness of the skin over a small lesion causes the hair to stand upright, which assists one in first noticing the disease. As a rule this is overlooked due to the heavy hair covering and mud and filth ; such a case is not reported until a line of sanguineous pus is seen down the limb, which results from the swelling having suppurated and ruptured. If such a small swelling be incised before or just after it has ruptured, it will be found to be composed of dark, blue-black necrotic tissue of rather firm consistency with a possible centrally located, suppurating focus, depending on the extent of development. A lesion of this kind develops very rapidly—apparently within twelve to eighteen hours. If it ruptures, the discharge is of a sero-purulent, sanguineous character. If the suppuration of the resulting ulcer is

allowed to continue for two or three days, the bulk of the necrotic tissue will have sloughed away, and the underlying surrounding subcutaneous tissue will have become involved and the lesion tends to progress. Two or more swellings may occur in close proximity to one another, in which case it is not uncommon for the affected areas to become confluent, particularly if neglected, resulting in a large open lesion. In many cases these small lesions occurred in short chain formations having some of the characteristics of epizootic lymphangitis. At times the initial lesion is apparently not a small, firm swelling, but develops as a fluctuating abscess the size of a pigeon's egg, or even larger. The contained pus is of a dirty gray colour, sometimes streaked with blood or creamy. Then again, a lesion may seem to at once involve a large area of several inches in diameter, manifesting itself as a warm, soft, very painful swelling. Such lesions, as a rule, develop near the tarsal or carpal joint. . . . Cases of this sort which are neglected will develop into large ulcerating, discharging lesions with little tendency toward spontaneous healing. Lameness is not uncommon and is often the first indication of this form of lymphangitis."

In the records of the location of the lesions in sixty-three animals it appears that these occurred on the hind limbs in 81·08 per cent. of cases. Another feature to which attention is called is that the greater majority of the lesions occurred in the more exposed parts of the body and limbs—that is, on those parts most liable to mechanical injury. Infection takes place through breaks in the continuity of the skin, through hair follicles or sebaceous gland ducts.

The presence of streptococci in a very high percentage of cases leads to the belief that this organism is probably the cause of one form of ulcerative lymphangitis. In the majority of cases the streptococci were found in pure culture, and strains proved pathogenic when injected into laboratory animals. In those cases in which streptococci were found alone, 84 per cent. were haemolytic.

The following surgical and chlorazene treatment yielded very satisfactory results in seven horses in which it was tried:—"The hair was removed from over the swelling, skin thoroughly cleansed, and a bichloride of mercury pack applied over the area and left there for three to five hours. The lesion was then incised with a sterile scalpel, scissors and curette, and cotton swabs saturated with one per cent. chlorazene solution were used to remove all necrotic tissue and pus. The wound was then painted with tincture of iodin and packed with gauze saturated with one per cent. chlorazene solution, the pack being kept in place by bandaging. This was kept moist with chlorazene for the next twelve to eighteen hours, when a new pack and bandage were applied. This treatment was continued until

granulation had proceeded sufficiently to warrant leaving the pack off, and applying a boric dusting powder."

ENZOOTIC PNEUMONIA OF CALVES. S. DODD. *Agric. Gaz., N.S.W.*, Sydney. Vol. XXX., No. 6. June 1919. Pp. 396-402.

Every year a greater or smaller number of calves in the dairying districts of New South Wales contract pneumonia in an enzootic form. In the late spring of 1918 Dodd was invited to make investigations into outbreaks in two districts, namely, Illawarra and Hunter River. The mortality had been serious, and ordinary remedies had not succeeded in checking the death-rate. The investigations showed that the pneumonias in the two establishments, nearly 200 miles apart, were entirely different, both being infectious, but due to quite different species of bacteria. The present paper deals only with the disease as it was found in the Illawarra district, where the cause was *Bacillus vitulisepticus* of the haemorrhagic septicæmia group.

The disease may be either acute or chronic. "The former is usually seen in calves only a few weeks old; very seldom in calves two months or more of age. The onset of the acute form is sudden, the period elapsing between the time of infection and the appearance of symptoms being short. The young animal usually becomes quieter than usual and its appetite is lessened. There is generally a pronounced increase of body temperature (up to 106° or 107° F.). Breathing becomes hurried and laboured. The animal stretches its forelegs and head out, and the nostrils are dilated. A more or less severe cough is often observed, and it is frequently accompanied by evident pain. Occasionally, however, a cough is not a pronounced feature in an affected calf; frothing at the mouth is often seen, and at times there is a thick, sticky discharge from the nostrils. Weakness increases very rapidly, and finally the animal is unable to stand up. Not uncommonly a profuse diarrhoea or even dysentery accompanies the pneumonic condition. In an acute attack, death usually takes place between the second and sixth day of the disease."

The chronic form of the disease may follow an acute attack, or may arise independently. At first, a cough may be the only symptom, but this becomes more evident as the disease progresses. The breathing becomes more difficult and hurried, and there is an increase in temperature. The appetite may be impaired and the calf may be less lively than normal, but this is not invariably the case. If recovery does not take place, the animal gradually loses condition, and may die in from four to eight weeks. Even after recovery the animal remains stunted in growth.

On post-mortem examination, small haemorrhages are found in the subcutaneous tissues, and the lymph glands are congested. More extensive subcutaneous or intermuscular haemorrhages may be present. "The lungs show consolidation in various stages, the parts affected being mainly the apical and cardiac lobes. Occasionally, however, the condition has progressed so much that almost the whole of one lung and part of the other may be involved. On one or two occasions a dry pleurisy has been met with also, but this was not usual in the investigations referred to. There is an excess of fluid in the pericardium, usually clear, but at times blood-stained. In very acute cases small haemorrhages may be seen around the base of the heart. The mucous membrane of the fourth stomach and the intestines is often deeply congested, and may be spotted over with small haemorrhages. On a number of occasions small shallow ulcerations have been seen on the mucous membrane of the bowels. The liver and kidneys are congested; the latter at times show small haemorrhages under the capsule, but there is no swelling of the spleen."

Other treatment having failed in the outbreak recently investigated by the author, inoculation with a vaccin prepared from the causal organism isolated from affected calves was undertaken. "The benefit derived from the use of this vaccin was very apparent, as the loss prior to vaccination was heavy, whereas, out of 200 calves inoculated, only one subsequently died of pneumonia due to the organism in question."

SWAMP FEVER IN WYOMING. J. W. SCOTT. *Bull. No. 121.* Univ. Wyoming Agric. Exp. Station. June 1919. Pp. 91-140. 6 Figures, 29 Charts.

Having as its chief aim the instruction of the farmer and ranchman in the salient features of infectious anaemia of the horse, this Bulletin is largely composed of a re-statement of observations and facts already published by various investigators. The results of certain experiments on the natural transmission of the disease are, however, given, with a promise that a full account of the investigation conducted in connection with the University of Wyoming Agricultural Experiment Station will be given elsewhere.

"Until 1914 only two general methods had been demonstrated in the experimental transmission of swamp fever. One method was by artificial inoculation of infected blood or urine through the skin, the other was the entrance of the virus through the walls of the alimentary canal following the ingestion of food or the drinking of water con-

taminated with infective blood or urine. The Japanese in 1914, as the result of pasturing experiments and a series of observations lasting five years, came to the conclusion that certain biting insects were responsible for transmitting the disease. However, they did not demonstrate such a transmission. As previously explained, from a study of the problem in 1913 the writer became convinced that the internal method of transmission could not adequately explain epidemics and certain other facts known to be true of swamp fever. Accordingly, a series of experiments was planned to ascertain whether insects were or were not capable of transmitting the disease. A full account of these experiments will be given elsewhere. It will suffice here to give the general results obtained. By using a screened cage it was shown in the summer of 1914 that swamp fever may be transmitted by certain flies, with the evidence pointing toward the stable-fly, *Stomoxys calcitrans*, as the active carrier. In 1915 use was made of two screened cages. A system of exchange was used by which the same sick horses were exposed equally in both cages; stable-flies were raised in only one of the cages, the other being kept fly-free. Well horses were kept in both cages so that they were all equally exposed to the sick horses. The disease was transmitted only in the cage that contained the stable-flies, and two out of three horses so exposed took the disease. In this and the following year additional experiments fully demonstrated that the stable-fly may act as a carrier of swamp fever; this involved the isolating of sick horses in one cage, the well horses in the other, and the controlled transfer of flies from the backs of sick to the backs of well horses. In 1916, by a similar use of small screen cages for transferring the flies from isolated sick to isolated well horses, it was shown that swamp fever can be transmitted by the bites of certain horse-flies belonging to the genus *Tabanus*. This work was further confirmed in 1917. In all of the later experiments the plan of interrupted feeding was adopted and the transmission of the disease was undoubtedly a mechanical one. It was further shown by using a medium fine hypodermic needle for puncturing the skin of a sick horse and then a well horse, and by repeating the process a number of times on following days, that a very minute quantity of blood is sufficient to produce the disease."

Without denying the possibility of the natural transmission of the disease by infective urine, the author believes that his experiments demonstrate the probability that insects play an important part in transmission, especially during epidemics of the disease. This theory helps to account for the seasonal occurrence of infectious anemia, since biting flies are most abundant in Wyoming during August and September. Coinciding with the prevalence of the disease

also, biting flies are most abundant during wet seasons and in wet regions.

THE HEREDITY OF RABIES.

"Contribution à l'étude de l'hérédité de la rage." P. REMLINGER.

Ann. Inst. Pasteur, Paris. Vol. XXXIII., No. 5. May 1919.
Pp. 375-388.

"Comment un chien d'apparence saine peut transmettre la rage." P. REMLINGER.

Rec. Méd. Vét., Paris. Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 15th May 1919. Pp. 175-181.

"L'hérédité dans l'étiologie de la rage. Explication de certains cas de 'rage spontanée' des jeunes chiens." P. REMLINGER. *Ibid.* 5th June 1919. Pp. 196-198.

The recent observations of Konradi on the possibility of the heredity of rabies have led Remlinger to study the question. His experiments on conceptional transmission in rabbits and guinea-pigs have been negative (see this *Review*, 1918, II. 306); but his observations on the passage of the rabies virus from the mother to the foetus *in utero* demonstrate the possibility of transmission under three different conditions:—(1) In the post-mortem examination of animals dead of rabies, foetuses more or less advanced in development have been found in the uterus. Inoculation of brain emulsion of these has produced rabies, in one case 123 days after inoculation, and in another on the 236th day. (2) Some days before dying of rabies, an animal gave birth to one young that remained apparently healthy until the 43rd day, when it developed symptoms of rabies and died. (3) Fifty days after inoculation with rabies virus, an animal gave birth to three young. One of these died from some cause other than rabies. The other two developed rabies when 32 days old. The mother remained well and apparently healthy until 122 days after inoculation, 68 days after parturition, and 38 days after the death of her offspring. It should be added that all these observations have been made on guinea-pigs.

Remlinger thinks that the above facts may throw light on: (1) certain cases of the transmission of rabies by apparently healthy dogs; (2) the development of rabies in young animals that have not been bitten, nor licked, nor in any other way infected by diseased animals; (3) those cases of immunity in certain dogs that have been recognised since the first researches of Pasteur and Roux. The author also comments on the possible latency of the rabies virus in the nervous system and the possible polymorphism of its manifestations.

A CHRONIC POX-LIKE INFECTION IN GOATS AND ITS SUCCESSFUL TREATMENT. R. V. STONE and C. W. FISHER. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 536-543.

Early in the spring of 1917 an outbreak of disease occurred in a herd of goats. Inquiry elicited the information that the condition had been introduced from the southern part of the State (California) in which the outbreak was observed, and from Arizona. The disease spread rapidly through a large herd, and especially affected young does soon after freshening. Thus it caused much loss in milk and flesh. The lesions in the early stages resembled those of goat-pox; but whether the disease was goat-pox or a condition with similar lesions could not be determined. Apparently one attack of the disease did not confer immunity. A pure culture of a Gram-positive staphylococcus with orange pigment was isolated from every specimen taken. Bacterins prepared from this organism produced a rapid recovery in affected animals. Three distinct forms of infection were treated successfully with bacterins, namely, arthritis, exanthemata, and multiple subcutaneous abscesses. Cases in which bacterin was not employed did not recover rapidly, the lesions persisting for at least a year and a half.

ANTI-VARIOLA OVINA VACCINATION WITH SENSITISED VIRUS (Vaccination anticlavéleuse par virus sensibilisé dans les Bouches-du-Rhône). E. CANABY. *Rec. Méd. Vét.*, Paris. Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 243-248.

The Department of Bouches-du-Rhône forms a particularly favourable area in which to study sheep-pox and the various measures devised for its suppression. In addition to endemic centres of infection, the department is subject to fresh infection by imported African sheep. The writer of the present paper has extended his observations over a period of five years, and has noted the effect of the vaccination introduced by Bridré and Boquet. He concludes that vaccination with sensitised virus appears to be capable of playing the chief rôle in prophylaxis against sheep-pox. By this method it is possible to arrest with certainty the spread of the disease in an infected flock; and, when used extensively at the same time in flocks more or less directly or indirectly exposed to infection, it is possible by its means to create a zone of protection that prevents spread from infected centres. He adds that the immediate consequences of the vaccination have been exactly those claimed for it by the authors of the method.

MEDICINE.

PSEUDO-GLANDERS (Einige Bemerkungen über "Pseudorotz.") R. SCHNEIDER. *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 235-237.

The author has met with four horses, all from the same place, with lesions of the nasal mucous membrane that led to the suspicion of glanders. Some of the lesions were red patches of different size, without any real ulceration, and without any elevation of their edges. In one horse there was an erosion of the mucous membrane covered by a small dry scab, and in another animal there were four straw-coloured nodules, about the size of the head of a needle, surrounded by a reddened border. In none of the animals was there any discharge from the nose, or any swelling of lymph glands. The mallein test was negative in all cases.

In a few days nodules had given place to small red patches with slight erosion of the mucous membrane. It appears, therefore, that the nodules were an early stage in the lesions.

The writer thinks that it is not improbable that the lesions, which he calls *acne nasalis*, may have been due to a mycotic infection from the peat litter with which the horses were bedded, or from the hay.

“RAILWAY FEVER” IN CATTLE.

1. “Note sur la fièvre des chemins de fer des bovins.” BÉDEL. *Rec. Méd. Vét.*, Paris. Vol. XCV., No. 4. 28th February 1919.
Bull. Soc. Centr. Méd. Vét. 6th February 1919. 1p. 61-64.
2. “La maladie des chemins de fer des animaux de l’espèce bovine.” R. MOUSSU. *Ibid.* Nos. 10 and 12. 30th May-30th June 1919.
Bull. Soc. Centr. Méd. Vét. 19th June 1919. Pp. 216-219.

1. Bédel thinks the term “railway fever” may appropriately be applied to a condition he has observed in cattle that have been on a long railway journey without proper care and feeding. The animals leave the railway truck with half-closed or weeping eyes. They stagger, and, having been deprived of water for some time, drink with avidity any fluid to which they have access. He has seen it impossible for the attendant to prevent an animal drinking a solution of cresyl! When in the byre or stable the animal hangs its head, and arches its back. The abdomen is retracted. Stamping with the feet is frequent, and there is grinding of the teeth. Appetite is small or absent. The muscles of the thigh, flanks, and arms tremble. The

muzzle is dry. Sometimes the muscles of the thigh and back are painful. Rumination is suspended, or infrequent and incomplete. There is constipation, with frequent efforts at defaecation. The faeces are dry, black, and covered with blood-stained mucus. Sometimes straining may result in prolapse of the rectum. The temperature usually fluctuates between 39° and 39·5°. It sometimes, but rarely, reaches 39·8° or 40°.

With proper attention the symptoms subside gradually and entirely disappear after five or six days; but in some cases they may persist for eight or ten days. Driving the animal any distance aggravates the symptoms, and may lead to death.

The author regards the condition as an autointoxication, induced by deprivation of water and food and the prolonged standing of the cattle during the railway journey.

2. Moussu says that he has frequently met with the "railway fever" to which Bédel has called attention as occurring in bovines after a long railway journey. By comparison with those described by Bédel, which appear to have been comparatively benign, Moussu has seen cases of much greater severity. On leaving the railway truck the animals have staggered at each step, and have been with difficulty removed to the place where they were to be housed. Frequently they stopped, insensible to any stimulus, and assumed the characteristic attitude of an animal with laminitis. In the stable they often assumed a position of sterno-abdominal decubitus, without movement, and in a state of torpor and complete exhaustion. Sometimes there was violent muscular tremor of the buttock, thigh, and arm. On palpation the hoofs were hot, and percussion of them caused pain. Some cases died, and others were slaughtered because death was imminent. Post-mortem examination has shown slight lesions only, in the form of multiple congestions that might be post-mortem. The temperature in the earlier phases of the affection has been elevated (as much as 40° C.), but in cases slaughtered *in extremis* it has been lower than normal (37·7° to 36·2° C.).

Moussu has analysed the urine for albumin and sugar. In all cases, but especially in the graver instances of the disease, there has been marked albuminuria (from 0·65 to 1·75 grammes per litre). Search for sugar has been systematically undertaken, but it was found in two cases only, one of which was fatal.

Bédel regards the disease as an autointoxication, and in this Moussu agrees. The curative treatment, therefore, consists in bleeding, the injection of arecolin, and the administration of a purgative. Intravenous injections of normal saline are also indicated.

NOTES ON INFESTATION OF THE SKIN, ETC., OF SHEEP BY GRASS SEEDS.

S. DODD. *Agric. Gazette, N.S.W.*, Sydney. Vol. XXX., No. 4. April 1919. Pp. 255-259. *Journ. Comp. Path. and Therap.*, Edinburgh. Vol. XXXII., No. 2. June 1919. Pp. 90-95.

Velu (see *Review*, 1917, I. 202) has already called attention to the pathogenic rôle of *Stipa tortilis*. Dodd now shows that penetration of the skin by grass seeds is not confined to any one country, but occurs as a common condition of some economic importance in New South Wales. The seeds that are apparently responsible are those of the species of the genera *Stipa*, *Aristida*, and *Hordeum*, also *Festuca bromoides*, and possibly those of the genus *Andropogon*.

"Sheep heavily infested with seeds stand apart from their fellows. They are disinclined to move about, and when they do so, it is with a peculiar stiff gait; at times as if the skin had lost its flexibility, at others as if the animals were walking on hot stones. The stiff carriage of the body is due in the first instance to the thick mass of grass seeds embedded in the wool, and secondly to the pain produced by the sharp seeds piercing the skin. The tender gait is due to the seeds piercing the skin between the claws of the hoof and around the coronet. Ophthalmia, often followed by blindness, particularly in animals with very woolly faces, is common. . . . On account of the considerable pain set up by the seeds piercing the skin, the affected animals show more or less irritation of the body, biting and scratching at the places, and rubbing against trees, etc. . . . There is more or less considerable loss of condition, with fever. The animal refuses to seek for feed; it suffers pain on being handled or moved, although this may pass unnoticed even by the observant."

The individual skin lesions are not very considerable. The grass seeds pierce the skin and gradually work through, and in the majority of cases come to rest in the subcutaneous tissue. At times numerous small abscesses or small superficial ulcers are formed, though in the majority of cases there is no suppuration. In some instances the pus is greenish in colour, and apparently due to the presence of the *Preisz-Nocard* bacillus. Sometimes the seeds may penetrate deeper than the skin and find their way into the muscles. Not rarely they even enter the chest or abdomen, where they give rise to a fatal pleurisy or peritonitis. Seeds have also been detected in the liver, kidneys, lungs, etc. The lesions of the eye are an inflammation of the conjunctiva or the cornea, usually of a purulent nature; and if nothing is done, penetration of the cornea often results. Lesions about the hoofs are very common, and secondary bacterial infection may take place. If not attended to, the suppuration may involve the joint.

The death-rate is highest in lambs and weaners, in which the infestation is more common than in adult sheep. If care be taken, mortality is low; but if attention is withheld, the death-rate is high. In one instance the mortality among neglected weaners was 75 per cent. The lightest losses occur where seeds are not abundant, or precautions to prevent infestation are taken in time; and the heaviest losses occur where the reverse is the case. The economic loss from depreciation in the value of the skin, loss of condition of the animal, and the effect upon the health and growth of the young animal, is much greater than the actual loss by death.

"The steps taken by various sheepowners are, by the nature of things, nearly entirely preventive. They consist of different plans to prevent the sheep coming in contact with the ripe grass before the seeds are shed, or, in some cases, trying to prevent the seeds reaching the skin. Once the seeds have fallen, no more trouble is apprehended save, perhaps, from the hoofs."

THE BLOOD IN CHRONIC PULMONARY EMPHYSEMA IN THE HORSE
 (Blutbefunde bei Lungendampf des Pferdes). E. AUGSBURGER.
Schweizer Arch. f. Tierheilk., Zürich. Vol. LXI., Nos. 5-6.
 May-June 1919. Pp. 199-228.

The author has examined the blood of fifty horses suffering, in varying degree, from pulmonary emphysema. For purposes of comparison, he has also examined the blood of a number of healthy animals. The average figures for the specific gravity, haemoglobin, number of erythrocytes per cubic mm., and the percentage of erythrocytes may be given in the following tabular manner:—

	Sp. gr.	Hæmoglobin.	Number of Erythrocytes per cubic mm.	Percentage of Erythrocytes.
In healthy horses	1062·5	84·8	9,471,000	49·5
In pulmonary emphysema—				
9 incapable of work	1058·5	80·0	9,231,000	45·7
20 incapable of work	1057·6	76·6	8,610,000	43·5
21 destroyed	1056·4	76·3	8,689,000	43·0

It appears that the specific gravity, haemoglobin, and erythrocytes all diminish in accordance with the severity of the lesions. An examination of the red marrow of the femur of horses suffering from pulmonary emphysema revealed a marked proliferation of erythroblasts.

PARAPLEGIA CAUSED BY OVER-FEEDING WITH MOLASSES (Paraplégie par suralimentation mélasse). L. ROSSIGNOL. *Bull. Soc. Méd. Vét. Pratique*, Paris. Vol. III., No. 6. June 1919. Pp. 157-158.

Two cases of paraplegia with haemoglobinuria occurred in one stable, and it is suggested that the cause of the trouble was the ingestion of an excessive amount of molasses.

The daily ration was made up of oats 2 kilogrammes, molasses food 2 kilogrammes, hay 5 kilogrammes, and some straw. The molasses food was made of flax chaff soaked in molasses, the latter constituting more than 50 per cent. of the mixture, so that the horses consumed daily more than 1 kilogramme of molasses. The horses were in a very robust state notwithstanding their hard work, which only ceased on Sundays.

This mixture had been fed for a considerable time. When the proportion of molasses was reduced by two-thirds no further cases occurred. In discussion, Dechambre expresses the opinion that the potassium salts consumed in this large quantity of molasses might have had an irritating effect on the kidneys. (R. G. L.)

CHOLERA OF THE SHEEP (JAUNDICE; YELLOWS OR YELLOWSES; HEADGRIT OR PLOCACH). J. P. M'GOWAN. *Lancet*, London. Vol. CXCVII., No. 5010. 6th September 1919. Pp. 426-429.

This is a preliminary note on an epizootic and enzootic disease of sheep recognised throughout Scotland under the various synonyms given above. It affects lambs of the year usually, that is, when they are about six months old, and generally occurs during the months of August and September. The chief characteristics of the disease are thus summarised by the author:—

"Affected animals in the fatal cases live for a period varying from a few days up to a fortnight or three weeks. The disease commences with a colliquative diarrhoea, and in a few days the animals shrink markedly in size. The disease is characterised by great thirst. Jaundice and headgrit (swelling in the parotid region) cases and cases with loss of ears are occurring at the same time, and these cases are affected with this same diarrhoea. There is marked dryness of all the tissues of the body on post-mortem examination; the intestinal tract, however, is empty of food, and is full of a large quantity of greenish-yellow watery fluid, which can be detected during the life of the animal by its 'jumbling.' There is marked inflammation of the fourth stomach and duodenum. The fact of the whole of the lambs, apart from those

obviously ailing, having received a bad check would seem to indicate that there were a large number of them suffering from the disease in a milder and not so noticeable form. It is a disease with a high mortality at times, and can cause great financial loss to the owner."

From his bacteriological examination of sheep and experimental work on rabbits, the author thinks that a bacillus of the paratyphoid group has strong claims to be considered as causal. He institutes a comparison between the disease and cholera of the human subject, and finds several points of resemblance.

Regarding the colliquative diarrhoea, the author points out that it may be due to a specific cathartic toxin in the causal organism, but regards it as more likely "that it is due to a toxin (much less specifically and drastically cathartic, and which occurs in very many intestinal organisms besides the two mentioned) acting on a *specific locus* of the intestinal tract. The emphasis of the specificity is rather on this locus—the duodenum—than on the toxin."

BLINDNESS IN CALVES DUE TO INSIDIous RACHITIS. W. J. CROCKER.

Cornell Veterinarian. Vol. IX., No. 3. July 1919. Pp. 171-174.
2 Figures.

Ten calves in a herd of Guernsey cattle in Pennsylvania went blind within a period of a few weeks. Some of the calves were born blind, while others, ranging in age from a few days to one year, suddenly developed the condition and neither recovered nor improved. Animals "apparently normal in every respect one day were found the next morning walking carefully and slowly about, raising the feet high and placing them on the ground gently. They walked straight into any object which happened to be in their path, as a barn or fence, without seeing it. Temperature, pulse, and respiration were not increased, and no clinical manifestations of disordered conditions could be observed with reference to the respiratory, digestive, cerebro-spinal, genito-urinary, osseous, vascular, or any other system of the body except the eyes. They were blind and nothing more."

It was determined that all the blind calves belonged to cows that had been highly fed "in striving for a double-letter classification of this breed"; and the author thinks that this cramming process induces a disturbance in the metabolism of mineral matter to a slight degree. "While the disturbance in bone structure is not great, slight or insidious changes do occur in the sphenoid bone of the foetus, especially in the region of the optic canal or foramen. The bone is swollen, soft and thickened; it tears like fibrous tissue instead of breaking like bone. . . . It grows in such a manner as to stenose the optic foramen

or canal, which is from $\frac{1}{4}$ to 1 inch long, and compresses the optic nerve within it. The pressure sets up a low-grade chronic optic neuritis which develops into a complete fibrosis of the nerve with pressure atrophy and complete disappearance of the nerve fibres."

METHODS.

THE CULTURE OF THE TETANUS BACILLUS IN THE PRESENCE OF TUBERCULIN.

1. "De la culture du bacille du tétanos en présence de la tuberculine." F. MARINO. *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 6. June 1919. Pp. 349-352. "De la culture du bacille tétanique en présence de la tubéruleine. Procédé de dosage de la tuberculine." F. MARINO. *C.R. Soc. Biol.*, Paris. Vol. LXXXII., No. 22. 12th July 1919. Pp. 821-822.
2. "De la culture du bacille tétanique en présence de la tuberculine. Détermination du pouvoir antitoxique des serums antituberculeux." F. MARINO. *Ibid.* Pp. 823-824.
3. "De la culture du B. tétanique en présence de la tuberculine." F. MARINO. *Ibid.* Pp. 831-832.

1. From the results of his experiments, Marino concludes that a culture medium containing 1 mg. of tuberculin per c.c. never permits the growth of the tetanus bacillus. This suggests a very convenient method of estimation of the amount of tuberculin present in a culture of the tubercle bacillus. Ten c.c. of the filtrate of a tuberculous culture is placed in a test tube and sown with tetanus bacillus. If the tetanus bacillus, under anaerobic conditions, does not grow, it may be concluded that at least 1 mg. of tuberculin per c.c. is present. In order to estimate the amount of tuberculin more exactly, ten tubes are taken, and in them is placed a quantity of filtrate increasing from 1 to 10 c.c., along with ordinary bouillon decreasing in amount from 9 to 1 c.c. The tubes are then sown with the bacillus of tetanus, and rendered anaerobic.

2. Following up the above method, Marino discovered that anti-tuberculous serum and normal serum, in general, neutralise tuberculin without any difference, both permitting the growth of the tetanus bacillus at the end of forty-eight hours. Sometimes one may even find that normal serum neutralises tuberculin better than does anti-tuberculous serum, permitting the growth of the tetanus bacillus at the end of forty-eight hours, while the specific serum may not permit growth until the end of the third or fourth day.

3. Using the same method, Marino found that the human and bovine types of the tubercle bacillus permitted the growth of the tetanus bacillus up to the 30-35th day, while the equine type of the tubercle bacillus permitted the development of the tetanus bacillus up to the 50th day. The amount of tuberculin in cultures of human and bovine bacilli was always greater than in cultures of the equine bacilli of the same age.

OBSTETRICS.

STERILITY IN COWS.

1. "A Preliminary Report on the Pathology of the Reproductive Organs in Sterility." E. T. HALLMAN. *Cornell Veterinarian*. Vol. IX., No. 1. January 1919. Pp. 28-36. 2 Plates (10 Figures).
2. "Abortion and Sterility." E. T. HALLMAN. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 297-302.

1. In his first paper Hallman gives the results of the microscopic and bacteriological examination of the uterine mucous membrane of four cows from a herd in which abortion and sterility had caused considerable losses. He found that the lesions were not extensive and apparently the result of a mild type of inflammation. There were superficial lesions involving the epithelium, in which mucoid degeneration was present. These were doubtless responsible for an alteration in the secretion from the membrane. Deeper lesions were also discovered in which various degrees of fibrosis were encountered. Some lesions were in the form of small foci of granulation tissue; while in other lesions the fibrosis was of the nature of scar tissue. The advanced stages of fibrosis had led to involvement of the uterine glands, with disintegration of their epithelium. The author concludes that the deeper lesions were the result of infection with micro-organisms of low virulence, but with the power to establish themselves for various lengths of time.

2. Clinically, the most outstanding symptom of the chronic catarrhal cervicitis and endometritis studied in the foregoing communication is failure to conceive. Rectal examination reveals but little change, if any. The best evidence of the existence of the disease is obtained by vaginal examination. The secretions are more abundant than normal, and often contain flakes and streaks of pus. Frequently there is an adhesive mucus that may be mistaken for the mucus of pregnancy.

The mucous membrane is congested, and, if the case is one of long standing, there may be hypertrophy of the folds around the external os and in the cervical canal of the uterus.

In the treatment of the condition, the author first cleans the cervical canal with physiological salt solution or a 2 or 3 per cent. solution of sodium borate. If it is desired to irrigate the uterus, the solution is forced into the uterine cavity until there is a moderate tension. But it is questionable whether uterine irrigations are indicated unless there is an appreciable quantity of inflammatory exudate in the uterine cavity. Hypertrophy of the folds of the cervical mucous membrane is corrected surgically.

Then 1 to 2 oz. of Lugol's solution is introduced into the uterus, and the uterus is massaged in order to force the solution into the cornua. The cervical canal is swabbed with undiluted Lugol's solution. The treatment is repeated at weekly or ten-day intervals if considered necessary. It is not assumed that the strong solution of iodin actually reaches and destroys the deep-seated organisms, but it is hoped that irritation and stimulation of the uterine mucous membrane reacts favourably on the defensive mechanism.

VAGINAL FIBROUS BANDS AND PARTIAL MEMBRANOUS OCCLUSION OF THE UTERINE OS IN THE COW (Sur les brides vaginales et les cloisons du col utérin chez la vache). J. HAMOIR. *L'Echo Vét.*, Liège. Vol. XLVIII, No. 3. July 1919. Pp. 88-91.

Strands crossing the cavity of the vagina are composed of fibrous tissue and covered by the vaginal mucous membrane. They are most frequently disposed in a vertical direction, and lie at a variable depth from the exterior. They are usually flattened from before to behind expanded where they are connected with the vaginal wall, and narrow towards the middle of their length, where they measure 1 to 3 or more centimetres in thickness. Hamoir has several times seen cases in which the foetal membranes have become entangled in the bands, thus hampering expulsion. In these cases the foetus has pushed the band aside, but it sometimes happens that a limb may become engaged between the band and the wall of the vagina. Clearly, surgical intervention, which is as simple as it is efficacious, is called for. Hamoir uses a bistoury; but, whatever the instrument may be, haemorrhage is insignificant.

Membranes developed in the region of the uterine os may also be a cause of dystokia. Hamoir gives particulars of two such cases. In one of them the membrane was annular, with a free border that hampered the passage of the head of the foetus. In the other case the membrane

was falciform. In both instances incision of the membrane was practised.

PROLAPSUS OF THE VAGINA. J. V. LACROIX. *Amer. Journ. Vet. Med.*
Vol. XIV., No. 8. August 1919. Pp. 392-394.

Various conditions are responsible, either directly or indirectly, for prolapse of the vagina. In mares, the author of this paper has not observed the lesion except as the result of injuries done to the parts in cases of dystokia. In sows, though much injury is frequently done by the manipulations of unskilled operators, prolapse is not usually the sequel. On the other hand, cows are very liable to the condition of prolapse, and it occurs in fat animals in which apparently it is the result of intra-abdominal pressure, a lax condition of the perineum, and probably a predisposition due to conformation. It may also occur in heifers and cows within a few hours after parturition, as a result of injury done to the cervix of the uterus.

Inactivity and the presence of loose areolar tissue in the recto-vaginal region certainly predispose to vaginal eversion, but prolapse is also seen in thin, weak, and even emaciated cows.

Prolapse in fat cows during fly time demands prompt attention, or complications arise. The protrusion may be injured, irritated, oedematous and swollen, and necrotic. In some thin cows, if the prolapse is uncomplicated, no marked disturbance may be occasioned. There may be no expulsive efforts, and little if any interference with the usual health. If the protrusion occur before parturition, the calf may be delivered, and the prolapse recover spontaneously. In other cases, however, considerable disturbance results, and amputation may be necessary.

In the treatment of prolapse where delivery of the calf is not the first consideration, thorough cleansing of the exposed parts should be the initial step. Injury to the tissues must be avoided, and irritating antiseptics or other agents must not be used. After cleansing, the parts are anointed with a bland anaesthetic preparation, such as a one per cent. carbolised vaselin or oil, and the parts are gently replaced. Straining is to be prevented by elevating the hind parts of the cow, administering chloral hydrate, or by holding a rough, stout pole over the lumbar region. Recurrence of the prolapse is prevented by the insertion of linen-tape sutures. Daily or more frequent douching may be required to prevent suppuration.

When prolapse occurs suddenly towards the end of gestation, dilatation of the cervix of the uterus may be justifiable.

When injury has been inflicted during parturition, and the vulva is

more or less infected, it may be necessary to apply hot antiseptic compresses or employ other means to check the infection. In fat show cows it is decidedly best to give the condition attention during the early stages, employing soothing, mildly antiseptic preparations locally, and using some suitable apparatus to retain the parts in position. "In these animals, probably the most satisfactory appliance employed to retain prolapsed vaginal parts in place, is the small-sized bull rings, such as are put in bulls' noses. Two such rings so placed that the space between the labial commissures of the vulva are equally divided may be worn for months or even years without causing trouble if ordinary care is taken to keep the parts clean when this is necessary."

"When amputation of the prolapsed fold of vaginal wall is necessary, the parts are preferably 'tied off' by means of the saddlers' stitch and amputated with a scalpel or scissors at a point distal to the line of suture. This is done after having completed all preparations, such as restraint, anaesthesia, and cleansing the field of operation. After-care consists in irrigation as suggested following reposition, and, if straining is violent, sutures may be necessary to hold the parts in position. If amputation is thought necessary, it must not be delayed, as this lessens chances for a satisfactory outcome."

PARASITOLOGY

(Including Entomology and Protozoology).

DEMODECtic MANGE IN THE HORSE (*Rogna demodettica nel cavallo*).

CROVERI and SALVESTRONI. *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 7. July 1919. Pp. 388-390. 1 Figure.

Cases of demodectic mange in the horse have been observed in America by Wilson, Gros, Walter, Berger, Miessner, Bidanet, Urbain, and others; but, so far as is known to the writers of the present paper, no cases have hitherto been met with in Africa. They are therefore induced to report the occurrence of a case in Italian Somaliland. The owner of a horse seven and a half years old reported that for about a fortnight there had been an increasing depilation of both scapular regions. The condition was such as to permit recognition of the various stages of the disease. At first, there were papules that exuded a small amount of exudate which soon formed crusts. The hair fell off, and coalescence of the bald spots led to the formation of an extensive area totally denuded of hair. Following depilation, a large scale formed that, when removed, was found to cover a reddened area of skin from

which there was a slight exudate that quickly formed a crust. The skin over the whole of the lesions became thickened and corrugated, with ridges running in a vertical direction. Compression of the skin produced a sticky, reddish-yellow serosity. Marked pruritus, and the tendency of the lesions to spread, led to a suspicion that the condition had a parasitic origin. Microscopic examination of the crusts and the expressed serosity confirmed this suspicion.

Though the parasite did not differ materially from the various forms of *Demodex* that have already been studied, there were certain features to which the authors direct attention. The male measured 205-215 μ in length, and was about 50 μ broad. The female was 220-240 μ by about 60 μ . The well-developed rostrum was broader than long. When viewed from the ventral aspect, the rostrum and cephalothorax together were much longer than the abdomen, which did not measure more than about a third of the total length of the parasite. From the dorsal aspect, however, the abdomen covered part of the cephalothorax, and so measured about half of the total length. The dorsal surface of the cephalothorax was delicately marked with concentric striae. The abdomen was marked with minute rings.

The authors suggest the name *Demodex folliculorum* var. *equi somalilensis* for the parasite.

Success attended the application of a mixture of chloroform one part, petroleum one part, and oil two parts, after thorough soaping and washing with warm water.

A NEW NEMATODE CAUSING PARASITIC GASTRITIS IN CALVES. A. L. SHEATHER. *Bull. No. 86. Agric. Res. Inst. Pusa. 1919. Pp. 5. 5 Plates (12 Figures).*

"The parasite that is the subject of this note was found in immense numbers in the fourth stomach of several calves which had died showing all the symptoms of parasitic gastritis, and there can be no doubt that it was responsible for the deaths." The average length of the male worm was 20 mm., the thickness of the body varying from 0·3 to 0·4 mm. In the female the average length was 23·5 mm., and the body was slightly thicker than that of the male and tapered to both extremities. A detailed description of the parasite is furnished.

When compared with the five genera of the sub-family *Trichostrongylinae* that are parasitic in the fourth stomach and duodenum of ruminants, namely, *Haemonchus*, *Nematodirus*, *Trichostrongylus*, *Ostertagia* and *Cooperia*, the following characteristics are noted in the worm that is described in this paper:—The caudal bursa is trilobed, with the posterior lobe symmetrically placed; the spicules are very long and

slender; and the vulva is close to the posterior end of the body (about $\frac{1}{4}$). "From this it would appear that the parasite is not identical with any species previously recorded, and, further, that it does not fall into any of the established genera."

A FEW NOTES ON AUTO-AGGLUTINATION. H. E. HORNBY. *Vet. Journ.*, London. Vol. LXXV., No. 6. June 1919. Pp. 207-211.

The author has made a series of observations on the auto-agglutination of erythrocytes in cases of equine trypanosomiasis. He concludes that neither the species of trypanosome nor the species of equine affected has any bearing on the phenomenon. Auto-agglutination may be present one day and absent the next. There is no correlation either between the presence or absence of the parasite and the existence of auto-agglutination, or between the clinical symptoms and the presence or absence of auto-agglutination. "In short, given a fly-struck equine, the chances are about even that the phenomenon will or will not be exhibited. The chances are unaffected whether the animal be suffering from an acute, sub-acute, or chronic attack, whether the body temperature be high or low, and whether the parasite be *T. brucei* or *T. congolense*." Seeing, then, that an absence of auto-agglutination does not preclude the existence of trypanosomes, the author's next series of observations was made with the object of determining whether the presence of the phenomenon was a sure sign that the animal was fly-struck. He therefore examined the blood of twenty horses in good condition and eighteen healthy mules. From this series, it appears that marked auto-agglutination is rare in healthy equines.

Coccidiosis of the Goat in Morocco (La coccidiose de la chèvre au Maroc et le parasitisme latent de *Eimeria arloingi*). H. VELU. *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 298-301.

Coccidiosis of the goat was first described by G. Marotel (*Soc. Sci. Vét. Lyon*, 5th February 1905, p. 52; *Rer. Gén. Méd. Vét.*, 1906, p. 19), and others have studied the disease since that time. Much, however, remains to be done. Velu now reports his observations on a truly epizootic outbreak of the disease as it affected eighty-two Spanish goats imported into Casablanca, and their sixty young. The causal agent was the same as that studied by Marotel, to which he gave the name of *Eimeria arloingi*.

The disease affected young animals exclusively, the age of those affected being only a few weeks. Twenty-five per cent. of the animals

died. The evolution of the disease was very rapid, and evinced itself by a progressive anaemia with intestinal disorder. The emaciation of the animals was striking. They lost their appetite, remained lying, and were indifferent to their surroundings. The faeces were normal at first, but a mucous and serous diarrhoea supervened. Coccidia were exceeding numerous in the faeces; and death generally occurred in about a week, though sometimes more slowly. The lesions were characteristic and resembled those encountered in cases of intestinal coccidiosis of lambs.

By feeding with fresh faeces, the parasite was transmitted to two healthy Moroccan bucks. Ten days after infection, the faeces were slightly altered from the normal. Instead of being in the form of hard, isolated pellets, they were expelled as a cylindrical mass. Coccidia were relatively abundant. A month later, the character of the faeces was the same and coccidia were fairly numerous; but the bucks did not present any visible sign of disease. The two experimentally infected animals could therefore be regarded as latent carriers of the parasite, capable of disseminating coccidia by means of the faeces. An examination of the remainder of the infected herd also demonstrated the latent parasitism of *Eimeria arloingi*. None of the adults of the herd showed any signs of sickness nor any indications of intestinal disorder, and yet an examination of their faeces revealed the constant presence of coccidia.

No form of treatment was of any avail. Chlorhydrate of emetin was not efficacious, and thymol, which in the hands of Italian veterinary surgeons has produced such good results in bovine coccidiosis, had no effect. Removal to new and sandy ground close to the sea, however, effected a rapid termination of the disease.

A NEW STRONGYLID OF THE PIG (Un nouveau strongylidé du porc).

A. RAILLIET, A. HENRY, and J. BAUCHE. *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 324-332. 5 Figures.

The three species of strongylides at present known as parasites of the domestic pig are as follows:—(1) *Characostomum longemucronatum* (Molin, 1861) or *Globocephalus longemucronatus*, found in the small intestine; (2) *Oesophagostomum dentatum* (Rud., 1803), met with in the cæcum, colon, and sometimes in the small intestine; (3) *Stephanurus dentatus* (Diesing, 1839), found in the kidneys, liver, and abdominal cavity. The new form the authors now describe appears to be related to the *Oesophagostominae*, but it cannot be classed with any of the genera that form this group: *Oesophagostomum*, *Chabertia*, *Ternidens*,

and *Agriostomum*. They therefore describe it under the name of *Bourgelatia diducta* n.g., n. sp.

The parasite was found in different parts of the caecum and colon of the domestic pig, at Hué (Annam), in company with *Oesophagostomum dentatum*, but in much smaller numbers than this worm.

A detailed account of the morphology of the male and female worm is given, and a comparison is made with *Oesophagostomum dentatum*, from which it can easily be distinguished by the naked eye by its thickness and opacity.

PREVENTION OF STRONGYLOYSIS IN RUMINANTS (Essais de traitements préventifs des strongyloses des ruminants). E. BRUMPT and R. CAUCURTE. *Bull. Soc. Méd. Vét. Pratique*, Paris. Vol. III., No. 6. June 1919. Pp. 168-174.

The various forms of treatment hitherto suggested for strongylosis in ruminants being either inefficacious, or dangerous, or extremely costly, the authors set themselves to answer, if possible, certain questions relative to the prevention of infestation. The experiment was conducted in a small field, about 2000 metres square, which had been contaminated by goats infested with a variety of strongyles. The goats had been removed from the field nine months before the experiment began.

Twelve lambs, bred and reared on a farm free from strongyles, were procured and tested for infestation. Two of them were kept as controls, and never passed either worms or eggs in the faeces. Two were pastured in a park previously occupied by *Antilope cervicapra* in the faeces of which numerous eggs of strongyles had been found. The remaining eight lambs were pastured in the field previously contaminated by heavily infested goats. Of the eight, two were allowed ordinary water to drink; two constantly drank a 0·5 per cent. solution of creosote in oil; two were given a 0·1 per cent. solution of sulphate of iron; and two drank a 0·1 per cent. solution of sulphate of copper. From the 16th May until the 15th July the eight animals were fed exclusively on the dry herbage of the field.

In spite of a season very unfavourable for strongyles, the lambs were infested by living for two months in the contaminated field, though this had been nine months empty of infected animals. Infestation occurred with all the parasites (except the lungworm) with which the field was known to be contaminated. The medicinal treatment mentioned above was supported for four and a half months without any bad effect on the health of the lambs. The preventive medicaments employed were totally inefficacious. All the treated animals harboured

worms, and four of them were even more heavily infested than the two lambs to which no medicinal treatment was applied.

The two animals placed in the park contaminated by *Antilope cervicapra* contracted strongylosis, thus showing that the worm (*Strongylus filicol*) harboured by the antelope may be transmitted to the sheep.

From the 15th July to the end of September the lambs were fed with forage from a field that had been several times inundated by the Seine and had not been used for pasturage for three years. The authors conclude that this forage was innocuous in so far as strongyle infestation was concerned.

RELATIONSHIP OF INSECTS TO PARASITIC DISEASE OF STOCK. G. F. HILL.

Proc. Roy. Soc. Victoria, Melbourne. Vol. XXXI., No. 1.
December 1918. Pp. 11-107. 7 Plates.

The paper opens with an account of the life-history of *Habronema muscae*, *H. microstoma*, and *H. megastoma*. The economic importance of the insects rests on the belief that the larvae of *Habronema* cause disease in the horse, and abscesses of the spleen and stomach due to *H. megastoma* are becoming more common in Australia, where they lead to considerable mortality in certain conditions. Experiment shows that the embryos of *H. muscae* passed with the faeces of the horse are taken up by the larvae of *Musca domestica*. Here the embryos develop until, by the time the fly has become adult, the embryos have reached a condition fitting them to continue development in the stomach of the horse. Infection of the horse is probably the result of the ingestion of both living and dead flies from drinking-troughs and mangers. The supposition that the horse may become infected by the ingestion of the parasite after its escape from the fly is not supported by fact.

Though the adult *Habronema microstoma* has been known since 1866 as a parasite in the stomach of the horse, its life-history has hitherto been unknown. From experiments it appears that *Stomoxys calcitrans* is the chief intermediary host, and that *Musca domestica* only occasionally, and possibly only accidentally, plays the part of carrier. The embryos of *H. microstoma* that have been passed with the faeces of the horse are ingested by the larvae of *Stomoxys calcitrans*. Development of the embryos continues until *Stomoxys* is adult, and the horse is infected by the ingestion of the adult fly, either living or dead.

Habronema megastoma has been incriminated as the cause of tumours of the stomach and abscesses of the spleen of the horse. The intermediary host is *Musca domestica*, *Stomoxys calcitrans* apparently never acting in this capacity. Development is completed in the stomach, where the larva either gains a tumour formed at an earlier infestation,

or else enters the lumen of a gland and causes, by irritation, the formation of a new tumour.

Investigations into certain points regarding the life-history of *Melophagus ovinus* L. are dealt with in the second part of the paper. *Melophagus* does not leave its host to oviposit, but spends the whole of its life on the host. In winter, at a temperature of 43° F. to 47° F., the pupal stage was found to last 22 to 24 days; while in summer, at a temperature of 47° F. to 72° F., it was from 19 to 21 days. Young females are capable of pairing 5 days after emergence from the pupæ, and the first pupa is extruded 13 to 23 days after emergence. In Victoria, *Melophagus ovinus* has been kept alive off the host for 11½ days in summer when the conditions were cool and uniform. The unfed insect under 1 day old, and the young insect of 3 to 7 days that has fed on the host, die sooner than the adult when removed from the host. An adult female has been kept off the host and without food up to the 18th day. A certain proportion of the pupæ can live for periods up to 42 days after removal from the host, if the temperature is not extreme. This possibly indicates that sheep freed from the parasite may be reinfected by individuals left on the grass, etc., or by those dislodged from the fleece of infested sheep. At the same time the number that survive for more than 4 or 5 days is very small, and cannot account for the general re-infestation of a clean flock. The conclusion is arrived at that the parasites found on dipped sheep are the progeny of pupæ that have escaped the action of the dip. All the experimental sheep used by the author had to be dipped twice, though strong solutions, such as 2 oz. of cyllin to 1 gallon of water, were used for the first dip.

ALVEOLAR ECHINOCOCCUS OF BOVINES (*Equinococo alveolar de los bovinos*). J. LLAMBIAS. *Revista Zootecnica*, Buenos Aires. Vol. VI., No. 66. March 1919. Pp. 417-430.

Though the alveolar form of bovine echinococcus is much less common than the hydatid, it is not so rare that it is not possible to collect several cases in a short time. The bovine alveolar form is identical with the same form of the parasite in the human subject. It has not been proved that the differences in form depend upon distinct parasites; it would rather appear that one and the same parasite, the *tænia* of von Siebold, is the cause. As vegetative forms of the echinococcus, the formation of a scolex and the formation of plasmodia of Melnikow have been demonstrated. Daughter vesicles have not been discovered, but digitiform prolongations of protoplasm, which may be a means of expansion of the alveolar echinococcus, have been found. In both human and bovine alveolar echinococcus there is inflammatory

reaction. The differences between the human and the bovine disease depend upon differences in the reaction of the tissues.

EPIZOOTIC TRYPANOSOMIASIS IN BOVINES IN FRENCH GUIANA (Epizootie à trypanosomes chez les bovidés de la Guyane française). M. LEGER and M. VIENNE. *Bull. Path. Exot.*, Paris. Vol. XII., No. 5. May 1919. Pp. 258-266.

The authors report the occurrence of a trypanosomiasis, of an epizootic character, of the bovine population of Rémiere-Montjoly, an isolated village in French Guiana. It has been found impossible to trace the importation of the disease, for the village is a long way from other cattle centres in the colony, and is not on a route followed by herds. The symptoms are those of a progressive anaemia with a very appreciable leucocytosis. The first sign is emaciation, followed by œdema of the dewlap and intermandibular space. Though not constant, the œdema is very general. It is intermittent in character, disappearing for days or even weeks, and reappearing without any relation to the presence of trypanosomes in the peripheral blood. The appetite remains good for a long time. Diarrhoea is frequent, but intermittent, and the faeces contain neither mucin nor blood. The hair is lost in patches; there is lachrymation and discharge from the nose; progress is difficult, and may be in a circle; paresis of the hind limbs appears, and the animal dies in a few days after the beginning of decubitus.

There is no keratitis or ophthalmia, no early paralysis of the hind limbs, no lameness, and no pulmonary complications. Abortion has not been observed.

The trypanosome, which infects bovines and bovines only, is described, and regarded by the authors as belonging to a new species. They suggest for it the name *Trypanosoma guyanense*.

EFFECTS OF HEAT ON TRICHINÆ. B. H. RANSOM. *Journ. Agric. Res.*, Washington, D.C. Vol. XVII., No. 5. 15th August 1919. Pp. 201-221. 2 Tables.

It is well known that the larvae of *Trichinella spiralis* may be killed by thorough cooking of the pork in which they are located, but various writers give different figures regarding the actual temperature required to kill the parasites. The thermal death-point of trichinæ is a matter of great importance in connection with the cooking processes employed in meat-packing establishments. The simple rule of cooking pork until it is well done is not suited to conditions in meat-packing establishments. "The Bureau of Animal Industry, which is charged with the enforcement

of the Federal meat-inspection law, requires that pork and products containing pork cooked in establishments operating under Federal inspection shall be heated sufficiently to insure a temperature throughout all portions of the meat that will destroy the vitality of any trichinae which may be present, specifically a temperature of 137° F. (58° C.). This temperature is several degrees higher than the temperature that has been accepted by the Bureau as representing the thermal death-point of encysted trichinae, but the difference between the two represents no more than a reasonable allowance as a margin of safety."

To determine the thermal death-point with accuracy, experiments by the writers of the present paper on the effects of heat on the larvæ of *Trichinella spiralis* have been made with meat containing encysted larvæ, as well as with larvæ freed from their capsules by artificial digestion. From the experiments it appears that "the vitality of the larvæ of *Trichinella spiralis* is quickly destroyed by exposure of the parasites to a temperature of 55° C., gradually attained, the result apparently of irreversible coagulation changes in the protoplasm. This temperature may be considered the thermal death-point. Trichina larvæ exposed to temperatures slightly below 55° C. for short periods of time may recover from this exposure; but they die if exposed for longer periods, recovery or death depending apparently upon whether or not beginning coagulation of the protoplasm has proceeded beyond a stage from which a return to normal may occur. Exposed to temperatures in the neighbourhood of 50° C. trichina larvæ die if the application of heat is sufficiently long continued, apparently as a result of exhaustion following excessive activity to which they are stimulated by the heat. . . . Methods of destroying trichinae by heating at temperatures below the thermal death-point, which may be utilised in connection with the preparation of certain kinds of cured pork products, appear not to be applicable in the case of fresh pork."

PATHOLOGY AND BACTERIOLOGY.

BOTRYOMYCOSIS.

1. "Les formes actinomycotiques du staphylocoque." J. MAGROU.
Ann. Inst. Pasteur, Paris. Vol. XXXIII., No. 5. May 1919.
Pp. 344-374. 2 Text-Figures, 1 Coloured Plate (6 Figures).
2. "Botryomycosis." SIR JOHN M'FADYEAN. *Journ. Comp. Path. and Therap.*, Edinburgh. Vol. XXXII., No. 2. June 1919.
Pp. 73-89. 11 Figures.
1. Magrou points out that the staphylococeus has variable pathogenic properties and may produce lesions entirely different from acute

manifestations accompanied by the classic signs of inflammation. The organism has the power to induce chronic lesions, of which the most remarkable is botryomycosis, most frequently observed in the horse, but also described as having occurred in bovines, the pig, and the dog. Histologically the botryomycoma consists of an inflammatory nodule enclosed in a fibrous capsule. The centre of each nodule is occupied by botryomycotic grains surrounded by polymorphonuclear leucocytes. Mononuclear cells—rare in the immediate vicinity of the grains—become more and more numerous towards the periphery.

The object of the investigation now described was the isolation and culture of micro-organisms from botryomycotic tumours, and the study of their pathogenic action when inoculated into animals in conditions as near as possible to those in which the disease is naturally developed.

The organism isolated corresponded to that named botryococcus by many authorities; and its characters were exactly comparable to those of the staphylococcus. Inoculation of cultures by various methods into guinea-pigs produced lesions in which micrococci and club-shaped organisms were found. The lesions were exactly similar to the large botryomycotic tumours of the horse. The micrococci in the central zone of the lesions were identical in size, form, and staining reactions to the botryomycoccus or staphylococcus used for inoculation. Club-shaped masses formed a peripheral layer and were arranged radially about the central mass; and, like the clubs of actinomycosis, they were acid-resisting.

2. A considerable difference of opinion exists regarding certain details of the structure of those collections of cocci that were first described by Bollinger in 1870, and to which later he gave the provisional name of "botryomyces." As is well known, the botryomyces are found in chronic inflammatory and generally tumour-like lesions on the horse. The majority of those who have dealt with the subject have adopted the view, first advanced by Bollinger, that the granules are composed of cocci embedded in a homogeneous zoogloea or interstitial substance. This view is erroneous, for the apparent zoogloea, as well as the capsule surrounding the granular mass, is composed of unstained cocci. "It may be inferred that every elementary granule is at first composed of living, actively multiplying cocci, all of which are intensely Gram-positive. As a matter of fact, however, such a group of undifferentiated cocci is very rarely encountered. Apparently at a very early age in the life of the granule two things, occurring simultaneously or in quick succession, tend to destroy its original uniformity. One is the changes in the outermost cocci which lead to the formation of the so-called capsule, the ultimate thickness of which is determined by the number of strata of cocci involved. The second change is the death of

a number of the cocci in the interior of the young elementary granule, a result that is disclosed by their altered staining reactions."

From the lesions of botryomycosis it is possible to cultivate organisms, the so-called botryococci, that are indistinguishable from the common *Staphylococcus pyogenes aurus* by cultural, morphological, or staining characteristics. Why the staphylococci should assume the characteristic grouping in granules in botryomycosis may possibly be explained by the development of a certain degree of immunity that "may suffice to check, but not to arrest completely, the multiplication of the micrococci, with consequent reduced chemiotaxis and leucocyte emigration—conditions which are more favourable for the building up of large masses of a non-motile organism. Under this view the subjects of botryomycosis would have a beneficial but inadequate immunity, such as is acquired against the tubercle bacillus by most tuberculous subjects."

Botryomycotic lesions nearly always assume a tumour-like form, and may attain a large size, as is typically illustrated by the so-called scirrrous cord and tumours developed near the point of the shoulder. These lesions are mainly composed of coarse fibrous tissue, and contain scattered soft areas or small abscesses. The pus may be yellow and creamy, but is frequently mucoid and sometimes has a brownish tinge. It always contains the characteristic granules. "The immediate neighbourhood of the granules is usually occupied by polynuclear leucocytes, which, further outwards, become mixed with uninuclear plasma of fibroblast cells. The latter soon come to occupy the entire field, and in the outward direction they pass by the usual transitional stages into fully formed connective tissue. Giant cells are very rarely present at any part of the lesions."

There is little tendency to metastasis in botryomycosis, but it may occur either by the lymph or by the blood stream.

THE STREPTOCOCCI OF EQUINES. F. S. JONES. *Journ. Exp. Med.* Vol. XXX., No. 2. August 1919. Pp. 159-178. 1 Plate (4 Figures), 8 Tables.

The author was induced to enter upon this investigation largely because the relationship of the strangles streptococcus with those associated with influenza seemed confused. He also wished to ascertain whether streptococci similar to those found in strangles and influenza were usually present on the nasal mucous membrane or in the pharynx of apparently healthy horses. His observations were carried out in three classes of horses: (1) normal horses (eastern) that had been in the vicinity of Princeton, New Jersey, U.S.A., for some time; (2) apparently normal horses that had recently come from the Western

States; and (3) those suffering from strangles, influenza, rhinitis, and purulent conditions.

The following summarises the results of the examination of thirty eastern and twenty-three western horses:—

	Eastern.	Western.
Horses carrying non-hæmolytic streptococci on the nasal mucous membrane	8	8
Horses carrying hæmolytic streptococci on the nasal mucous membrane	0	8
Horses carrying non-hæmolytic streptococci in the pharynx	6	11
Horses carrying hæmolytic streptococci in the pharynx	18	11

"Among all the non-hæmolytic nasal strains those capable of fermenting mannite predominate. Those of the non-hæmolytic types from the pharynx of both classes of horses may or may not ferment lactose but all do ferment either raffinose or inulin. In no instance have any of the non-hæmolytic types proved pathogenic for mice. The hæmolytic strains from the nasal mucosa of the western horses were all of the *Streptococcus pyogenes* type. They were pathogenic for mice and rabbits. One strain from the pharynx of an eastern horse and eight from the throats of the western horses were of the same species. All the others corresponded closely in their fermentation reactions with non-hæmolytic streptococci from the same region. The streptococci from pathological sources were all hæmolytic. They have fallen into two groups; the larger group (*Streptococcus pyogenes*) produced acid in dextrose, lactose, saccharose, maltose, milk, and salicin, but failed to change the reaction of broth containing raffinose, inulin, or mannite. The streptococci of the smaller group (*Streptococcus equi*) differ only in their inability to ferment lactose or acidulate milk. Both types are pathogenic for mice. Rabbits are usually more resistant. *Streptococcus pyogenes* has been isolated from eighteen of twenty-two cases of influenza, three of six cases of strangles, and from eight of nine abscesses. *Streptococcus equi* was observed in four horses suffering from influenza and five others affected with strangles. This species was also found in an abscess and associated with both rhinitis and pharyngitis." Thus, the true etiological relationship of streptococci to both strangles and influenza is still in doubt. The author regards it as possible that nasal and pharyngeal infections may depend, to a considerable degree, on a lowered resistance. Such a condition may be induced either by a distinct primary infection by another organism or virus, or by a number of external causes. The proportion of infected animals after a journey appears to depend somewhat on atmospheric conditions, diminished

rations, overcrowding, and the length of the journey. A fact that points to a cause or causes other than the streptococcus is the frequency with which apparently normal horses carry virulent *Streptococcus pyogenes* on the nasal mucous membrane or in the pharynx.

"It is becoming a common practice to attempt to immunise horses with killed cultures of streptococci before shipment. From this investigation it seems that these vaccines should contain both the lactose-fermenting *Streptococcus pyogenes* and the non-lactose-fermenting *Streptococcus equi*."

The streptococci of horses, especially *Streptococcus pyogenes*, resemble those of the human and bovine types to a certain extent.

A historical survey of the literature dealing with the relationship of streptococci to various pathological conditions in the horse is given, and a bibliography of twenty-one titles is appended.

SENILE CHANGES OF THE TESTIS AND PROSTATE IN DOGS. L. W. SMITH. *Journ. Med. Res.* Vol. XL., No. 1. May 1919. Pp. 31-51. 1 Plate.

In this study thirty-two dogs, ranging in age from 6 weeks to 20 years, have been used. The testes of these animals may be arranged in four main groups: the prepubic testis of from 6 weeks to 1 year; the normal adult testis from 2 to 5 years, the transitional testis showing the intermediate steps from the normal to the senile atrophic testis in dogs of 6 to 10 years; and the senile testis in dogs of 12 years and more. In nearly every instance a parallel series of prostatic tissue is described, in respect of both gross and microscopic characters.

From his observations the author concludes that simple senile testicular atrophy from vascular sclerosis is entirely lacking. Atrophy is accompanied by either degenerative or proliferative changes in the epithelium, mesothelium, and endothelium of the testis. The epithelial changes, when degenerative, begin centrally in the tubules; when proliferative they generally begin in the spermatogonia. Mesothelial changes are usually proliferative and result in an increase of either the interstitial cells, or the connective stroma, or both. Endothelial changes, when degenerative, are sclerotic and indicative of atrophy; when proliferative they are usually accompanied by tumour formation. Senile testicular tumours may be divided into those derived from the epithelium and those derived from the interstitial cells. The tumour cells all show a tendency towards the undifferentiated type, with the power of mitosis in growth but not of differentiation and specialisation. Epithelial changes are localised primarily in single tubules; but several adjoining tubules may be involved by extension or fusion, with a

resultant single tumour or with an apparently focal area of atrophy. The usual atrophy of the epithelium is a mucoid degeneration of the cytoplasmic elements, beginning centrally in the tubule. In senility, the interstitial cells undergo a characteristic diminution in size, with the accumulation of large brownish pigment granules and the gradual disappearance of their lipid content.

In every case, with variation in degree only, the senile prostate undergoes a fibrous hyperplasia. There is usually simple atrophy of its glandular epithelium, with the accumulation of fat and the loss of secretory activity, usually also with cell desquamation. Sometimes, however, the epithelium may undergo hyperplasia, even to the extent of forming a firm tumour mass, or it may undergo metaplasia and become stratified to a depth of eight or ten cells. Hypertrophy of the prostate may be said to closely parallel the atrophy of the testis.

PHARMACOLOGY AND THERAPEUTICS.

STUDIES ON ANTHELMINTICS.

1. "I. Experiments with Repeated Doses of Oil of Chenopodium." M. C. HALL. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 416-423.
2. "II. The Anthelmintic and Insecticidal Value of Carbon Bisulphide against Gastro-Intestinal Parasites of the Horse." M. C. HALL, M. J. SMEAD, and C. F. WOLF. *Ibid.* No. 5. August 1919. Pp. 543-549.
3. "III. Chloroform as an Anthelmintic." M. C. HALL. *Ibid.* No. 6. September 1919. Pp. 652-659.

1. Two series of experiments were made to determine the method in which chenopodium can be most successfully used against hookworm in the dog, and to secure further data as to the anthelmintic action of the drug. In one series chenopodium was given in doses repeated over a number of days, and in the other series the drug was given in repeated doses during one day.

The results suggest that chenopodium in repeated doses of 5 minims daily for twelve days is rather efficacious against ascarids, whipworms, and, probably, hookworms. But this prolonged treatment has its objections from the point of view of the practitioner. The use of three 10-minim doses at one-hour intervals, followed by a purgative an hour later, gives promise of success in treating dogs for hookworms, but repeated treatment will not infrequently be necessary. From his

extensive experience the author is only able to formulate the following general statements regarding oil of chenopodium:—

"Oil of chenopodium has no equal as a drug for the removal of ascarids, as it will in the big majority of cases remove 100 per cent. of the worms present in the dog, and is apparently about as effective, under proper conditions of administration, against ascarids of man and swine. It is apparently as effective as anything against ascarids in the horse, and will probably give satisfactory results when it has been sufficiently studied to ascertain the proper dose and mode of administration.

"Chenopodium does not have, in our experience, as much value for removing hookworms in single therapeutic dose as does chloroform, but such experimental evidence as we have, together with the clinical evidence of thousands of human cases treated with chenopodium, indicates that in repeated doses, either at hour intervals or on consecutive days, it should prove reasonably satisfactory against hookworms in dogs.

"No drug can be depended on to remove whipworms when given in single dose, as the writer has stated elsewhere. Repeated doses of oil of chenopodium, 5 minims daily for twelve days, for instance, seem to give rather good results and warrant further investigations along this line. But the fact that santonin is not a gastro-intestinal irritant gives it the choice for use against whipworms, so far as we are aware at present. It can be given in doses of a half-grain or a grain daily, with equal amounts of calomel, and seems entirely safe when so given, so far as our experiments show.

"Chenopodium will occasionally remove tapeworms, but the numerous failures to remove any in a long series of experiments show positively that it cannot be regarded as a suitable anthelmintic for the removal of tapeworms, so far as dog tapeworms are concerned, so far as findings in regard to them can be applied to other tapeworms and hosts."

2. The observations on the action of carbon bisulphide were checked by a careful examination of the manure and by post-mortem examination of the animals to which the drugs had been administered. In experiments on eight horses it was found that carbon bisulphide was 100 per cent. effective against bots, that is, it removed all the bots from six animals infested by these parasites. The bots were mostly *Gastrophilus nasalis*, with a few *G. haemorrhoidalis*. Against ascarids (*Ascaris equorum* or *A. megalcephala*) the efficiency was 95 to 100 per cent. Carbon bisulphide was as effective in one 6-dram, two 4-dram, or three 3-dram doses, and it is probable that the smaller sum total of the drug in one dose is to be preferred to the larger total in several doses, especially as the gastric lesions seem to be less pronounced in the case of the single dose. Possibly a single dose of even less than

6 drams may be found to be adequate. The drug given without purgation will remove bots, but the parasites will not usually be found in the faeces during the first twenty-four hours of the treatment, and the maximum number are generally found in the manure of the third or fourth day after treatment. Dead bots may be passed for ten days, and may be present in the large intestine seventeen days after the administration of the drug. Ascarids are generally voided on the second or third day, but may come away as late as the eighth day.

It is found that carbon bisulphide is useless against worms in the posterior part of the digestive tract, the cæcum, colon, and rectum: that is, it has no value against pin-worms, *Strongylus* and *Cylicostomum*. This may be due to the rapid absorption of the drug in the stomach and small intestine. The simultaneous administration of linseed oil might carry the carbon bisulphide down the intestine more rapidly, but it is doubtful if this would cause the removal of worms from the large intestine.

The lesion caused by the administration of carbon bisulphide in hard capsules consists in inflammation in the cardiac portion of the stomach, usually over an area as large as a man's hand or larger. This subsides almost entirely in the course of two weeks.

"Obviously, adequate anthelmintic treatment for removal of all the common species of worms and bots from the horse would require consecutive treatments with carbon bisulphide and oil of chenopodium, the two anthelmintics now known to be dependable for the purpose."

3. The third study on the efficacy of anthelmintics referred to chloroform as a remedy for the removal of hookworms in dogs, and Hall summarises the results of the experiments as follows:—"A consideration of available facts to date with reference to chloroform as an anthelmintic, indicates the following: That in administering chloroform to dogs for removing hookworms, doses of 0·1 m.p.k. (mil per kilo body weight) are too small, and that doses of 0·2 to 0·3 m.p.k. should be used; that in the higher dosage chloroform will have an efficacy of perhaps 50 per cent., which is better than single doses of thymol or santonin will have; that normal dogs will survive doses of 3·65 m.p.k. in one dose and 5·0 m.p.k. in two doses on two successive days (Schultz states that two doses of 0·3 m.p.k. in 10 mils of castor oil each, given the same day, will kill; possibly the dogs in his experiment were not in good physiological condition, or other factors were involved); that normal dogs will show haemorrhagic gastro-enteritis for at least four days after doses of 0·4 to 0·6 m.p.k.; that the digestive tract will be in fair condition, in five to seven days after doses of 0·3 to 0·4 m.p.k.; that there will be entire recovery of the digestive tract in one to two months after doses of 1·0 to 2·0 m.p.k.; and that hepatic necrosis

may persist microscopically for over two weeks in animals given 0·3 m.p.k. Chloroform appears to be safe and more effective against hookworms in single dose than any other anthelmintic, but in doses of 0·2 m.p.k. it is only about 50 per cent. effective, and repeated treatment is necessary for removal of all hookworms present."

SODIUM OXY-MERCURY-ORTHO-NITRO PHENOLATE (MERCUROPHEN) WITH SPECIAL REFERENCE TO ITS PRACTICAL VALUE AS A DISINFECTANT.
J. F. SCHAMBERG, J. A. KOLMER, G. W. RAIZISS, and MARY E. TRIST. *Journ. Inf. Dis.* Vol. XIV., No. 6. June 1919. Pp. 547-582. 36 Tables, 4 Figures.

In a previous communication (*Journ. Amer. Med. Assoc.*, 1917, lxviii. 1458) the authors have briefly described the properties of a mercurial compound, containing 53 per cent. mercury, which they found to possess certain superior anti-septic and germicidal properties, and to which they gave the short name of "mercuropfen." They now report the results of further and more elaborate tests that demonstrate the superior properties of the substance over other mercurial compounds. "In germicidal activity mercuropfen is equal or superior to mercuric chlorid and other mercurial compounds containing more mercury; inasmuch as the germicidal activity of this class of compounds bears a relation to their content in mercury and the electrolytic dissociation of the mercury compound in watery solution, mercuropfen is of special interest from the chemotherapeutic standpoint."

The authors found that mercuropfen is generally more rapid in its germicidal activity than other mercurial compounds; appears to possess a special destructive affinity for cocci and spore-forming bacilli; has proved superior to mercuric chlorid in the disinfection of urine, faeces, sputum, pus, catheters, instruments, rubber gloves, and the skin; maintains a higher degree of germicidal activity in blood serum than mercuric chlorid; and does not precipitate protein in as high concentration as 1:100; nor does it irritate the skin or tarnish surgical instruments. Its action on instruments was tested along with other mercurial compounds by immersing steel, nickel, and silver-plated instruments in 1:1000 solution for 24 to 48 hours at room temperature. "Of the mercurial compounds tested in this manner only mercuropfen and mercury succinimid did not tarnish any of these instruments to the slightest degree, whereas mercuric chlorid, mercury acetate, mercury cacodylate, and mercury oxycyanid produced considerable tarnishing particularly of steel but not of silver-plated instruments; as is well known, mercuric chlorid cannot be used for the disinfection of surgical instruments by reason of this deleterious influence, as this compound not only tarnishes

steel and nickel-plated instruments but may even discolour silver-plated instruments on prolonged exposure."

"Mercurophen is somewhat more trypanocidal than mercuric chlorid and is capable of temporarily raising the bactericidal action of the blood after intravenous administration. In terms of mercury, mercurophen is less toxic for animals than other soluble mercurial compounds and this constitutes a fact of much importance in the chemotherapy of this class of compounds."

PHYSIOLOGY.

THE BLOOD PRESSURE OF THE HORSE. S. SCHILLING. *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 401-416.
2 Figures, 3 Graphs, 5 Tables.

Schilling's observations have been made with a sphygmomanometer the cuff of which is wrapped on to the lower extremity of the upper third of the tail. He finds that the ordinary type of instrument as used in human practice is applicable for taking the blood pressure of the horse, mule, and ox. In this way he has determined that the normal diastolic pressure in the horse is from 40 to 50 mm. of mercurry; the normal systolic pressure is from 90 to 100 mm. The systolic pressure is subject to wide variations, while the diastolic pressure is more constant. "The systolic pressure is higher in the colt than in mature animals. An increase in blood pressure is common in old age. Females have a slightly higher systolic pressure than males. Weight and condition as to flesh seem not to have any noticeable influence upon the blood pressure."

POULTRY DISEASES.

THE DIFFERENTIATION AND DISTRIBUTION OF THE PARATYPHOID-ENTERITIS GROUP. VI. AVIAN PARATYPHOID BACILLI: A COMPARATIVE STUDY OF *B. PULLORUM* AND *B. SANGUINARIUM*. F. W. MULSOW. *Journ. Inf. Dis.* Vol. XXV., No. 2. August 1919. Pp. 135-162. 22 Tables.

The author holds that there is little exact knowledge concerning the distribution of *B. pullorum* and *B. sanguinarium*, but he is apparently persuaded that both organisms cause considerable losses to poultry

raisers in many parts of the United States. He thinks there has been some confusion at times in differentiating *B. avisepticus* from *B. sanguinarium*. "*B. avisepticus*, however, may generally be distinguished from *B. sanguinarium* by its action in milk, indol production, fermentation of carbohydrates, agglutination reaction and pathogenesis. *B. pullorum* and *B. sanguinarium* do not produce indol, generally form hydrogen sulphide in a lead acetate medium, and produce a temporary acidity in milk, but later alkali is formed. *B. sanguinarium* usually produces alkali in a shorter time than *B. pullorum*. The casein is digested by most strains of these organisms. As regards fermentation. *B. pullorum* produces acid and generally gas in several carbohydrates, *B. sanguinarium* produces acid but no gas in the same carbohydrates, and in addition produces acid in dulcite and maltose. There is some variation in the reactions in maltose. Some strains of *B. pullorum* produce slight amounts of acid after several days' incubation, and two strains have produced acid and gas quite promptly in maltose." Agglutination tests show that there is an antigenic relation between these organisms and *B. typhosus*, *B. enteritidis*, and *B. abortus-equinus*; but such antigenic relations were not observed between these avian organisms and *B. avisepticus*, *B. dysenteriae*, *B. paratyphosus A* and *B. B. suis*, *B. proteus*, and *B. coli*. Agglutination and absorption tests with serums of rabbits immunised against these avian types suggest an antigenic relation between *B. typhosus*, *B. enteritidis*, and these avian strains.

Feeding experiments indicate that cultures of these organisms rarely produce injurious effects on laboratory animals. *B. pullorum* and *B. sanguinarium* produce a toxin when grown under proper conditions that is quite poisonous to rabbits.

"*B. pullorum* may be distinguished from *B. sanguinarium* by the inability of the former to ferment dulcite, while the latter ferments this carbohydrate. Also, the former organism does not generally produce acid in maltose and generally produces gas in several of the carbohydrates. *B. sanguinarium*, on the other hand, generally produces acid promptly in maltose and does not produce gas in any of the carbohydrates. Rhamnose is fermented promptly by *B. pullorum*, while *B. sanguinarium* does not produce acid before forty-eight hours' incubation. It appears, therefore, that there are sufficient differences between *B. sanguinarium* and *B. pullorum* to regard them as separate types."

[Another recent paper on the avian paratyphoid organisms is by Hadley, Elkins, and Caldwell, *Bull. 174, Agric. Exp. Station, Rhode Island State Coll., May 1918*; see this *Review*, 1919, III. 322.]

DEVELOPMENTAL PHASES OF THE PROTOZOON OF "BLACKHEAD" IN TURKEYS. E. E. TYZZER. *Journ. Med. Res.* Vol. XL., No. 1. May 1919. Pp. 1-30. 2 Plates (32 Figures), 2 Text-Figures.

Tyzzer prefaces his communication with a review of the various opinions that have been advanced respecting the etiology of "black-head." His own observations lead him to conclude that *Amœba meleagridis* Smith presents a variety of forms that it would be difficult to identify were it not for the constant presence of an extranuclear body. From this are derived the division centres and a well-developed paradesmose that may stretch from side to side of the dividing cell. Binary nuclear division similar to that described in trichomonads is frequently encountered. No indication of any process of multiplication other than binary division has been found. Slow amœboid motion may be observed in the warm chamber, but a large proportion of the organisms show no motion. "The various forms assumed by the parasite and their relationship to the pathological process indicate distinct phases of development. In the invasive phase, the parasite may ingest solid particles of food, and migrates freely through the tissues. The vegetative phase is characterised by the loss of motility and by the absorption of fluid in the place of ingesting solid material. The cytoplasm in both these phases is distinctly basophilic. The resistant phase is characterised by its small size, acidophilic cytoplasm and by encystment. Multiplication by binary division is most active in the invasive phase, continues in the vegetative phase and ceases in the resistant phase."

The author does not agree with Hadley that *Amœba meleagridis* is a cell parasite. It does not occur within cells until its motility is lost, and when within cells its reaction is purely defensive. As Smith has pointed out, infection with this organism is a remarkable example of the extensive destruction of the tissue of the host through pressure exerted by a rapidly growing parasite. "While the parasite shows a type of nuclear division similar to that of trichomonads and an extranuclear body resembling a blepharoplast, various other features characteristic of trichomonads have not been demonstrated. No intermediate forms connecting this parasite with the trichomonads associated with it in the cæca have been observed."

AVIAN DIPHTHERIA (Diphthérie aviare). DONNAT. *Rec. Méd. Vét.*, Paris. Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 248-259.

In 1917 Donnat had an opportunity to make an extensive study of avian diphtheria. The usual symptoms were noted, but it was also

observed that diphtheritic patches might be present in the mouths of fowls that, at first sight, appeared to be perfectly normal. In these cases the patches, instead of being fibrinous, thick, and whitish, were dry, tartar-like, and firmly adherent to the mucous membrane. When such a patch was removed, a granulating ulcer that bled on the slightest touch was left. The duration of the disease was found to be variable. One capon appeared healthy on the 10th August, presented a depressed appearance on the 15th, and was found dead on the 18th; while other animals did not die for eight months. Treatment was attempted by inexpensive drugs only (permanganate of potassium, 1 per 1000; sulphate of copper, 15 per 1000; iodin in glycerin), but no satisfactory result was obtained.

An organism was isolated that, in the fresh condition, had the form of a motile rod-shaped bacillus with rounded ends. In cultures it assumed three forms:—(1) Simple rods that measured 2·66 to 4·4 μ in length by 0·88 μ broad. (2) Coccus-like organisms 0·89 to 1·50 μ by about 0·7 μ . (3) Rod-like forms that attained a length of 7 μ and contained clearly marked vacuoles. The vacuoles and the coccus-like forms could not be classed as spores. Capsules could not be revealed by the methods of Ribbert or McConkey. The method of spore-staining of Klein (hot Ziehl stain for six minutes, decoloration with 1 per cent. sulphuric acid, and counter-staining with Loeffler's blue) gave the following results:—In young cultures (less than two days) the rods are uniformly stained blue and show no vacuoles. In cultures of from two to four days the rods have red-stained vacuoles and the rest is of a light blue tint. In older cultures coccus-forms are abundant and are stained red.

The cultural and staining characters of the bacillus are given. The organism is Gram-negative.

It was found that, in addition to the diphtheritic patches, the blood and the mucus from the trachea were virulent. The viability of the organism was considerable. Subcultures could be made from an agar culture eight months old. Buccal inoculation of the organism caused death of the fowl in from 38 to 103 days; intravenous inoculation was followed by death in 45 days on the average, and intramuscular in 63 days. Intravenous injection into the guinea-pig caused rapid death (4 days), while subcutaneous injection only induced a marked lymphatic reaction. There is an obvious attenuation of the virus in old cultures.

Desiccation had little effect on cultures. The organism seems to grow best in the presence of considerable moisture. Light has no effect on cultures. Moist heat for five minutes at 80° retards growth, and at 90° arrests it. Antiseptics *in vitro* kill bouillon cultures as follows:—1 in 300 carbolic acid, in 75 minutes; 1 per 1000 corrosive sublimate,

in 65 minutes; 50 per 1000 boric acid, in 90 minutes; 5 per 1000 permanganate of potassium, in 70 minutes; 1 per 2000 salicylic acid, in 35 minutes. Evidently, therefore, salicylic acid should be the remedy of choice.

The limited observation that was possible seems to suggest that the serum of a hyper-immunised horse may have a curative effect in avian diphtheria.

SEROLOGY AND IMMUNOLOGY.

THE IMMUNISING ACTION OF CHLORIDE OF SODIUM AGAINST ANAPHYLAXIS

(De l'action immunisante du chlorure de sodium contre l'injection anaphylactique déchaînante (Thérapeutique métatropique)).

C. RICHET, P. BRODIN, and F. SAINT-GIRONS. *C.R. Acad. Sci., Paris.* Vol. CLXIX, No. 1. 7th July 1919. Pp. 9-11.

If, three weeks after a first (sensitising) injection of horse serum into a dog, one gives a second (releasing) injection of 50 c.c. of the same serum to the same dog, a sudden and intense anaphylactic shock is always induced. Diarrhoea, intense, almost haemorrhagic, intestinal congestion, rectal tenesmus, vomiting, dilatation of the pupil, lowering of blood pressure, complete paralysis, asphyxia, weak cardiac action and precipitate pulse are the symptoms. Death supervenes in two or three hours, and sometimes in a few minutes.

But if, instead of injecting pure serum, one injects the same quantity of the same serum after having diluted it with nine times its volume of an isotonic solution (8 per 1000) of sodium chloride, at most there is only a little diarrhoea and rectal tenesmus, with slight paretic disorder of the muscular functions; and these signs disappear in a quarter or half an hour.

It is not the mere dilution of the serum that prevents anaphylactic shock; for if, instead of using an isotonic solution of sodium chloride, an equally isotonic solution of glucose, or a 4 per 1000 solution of sodium chloride, or distilled water, is used, anaphylaxis is still induced. Moreover, if the dilution of the serum is effected with five times (instead of nine times) its volume of isotonic solution, there is still anaphylaxis.

Instead of mixing the serum with the isotonic solution, the authors have injected the sodium solution and then the serum. This has not prevented anaphylaxis, whether the sodium solution has been injected forty-eight hours before, or immediately before, the serum injection. It is probable that, when so used, the sodium solution is inefficacious because of its very rapid elimination with the urine.

The immunising action of the isotonic solution may be explained by supposing that the sodium chloride impregnates the nerve cells, and thus renders them resistant to the anaphylactic poison. The nerve cells having become saturated with sodium chloride, are less able to fix other poisons in their protoplasm.

SURGERY.

LARYNGEAL HEMIPLEGIA ("ROARING.")

1. "Nouvelle série de recherches sur le cornage chronique par hémiplégie laryngienne." O. NAVÉZ. *Ann. Méd. Vet.*, Brussels. Vol. LXIV., No. 1. January 1919. Pp. 6-24.
Ibid. No. 2. February 1919. Pp. 52-60. *Ibid.* Nos. 3-4. March-April 1919. Pp. 73-80.
2. "Sur la nature des hémiatrophies laryngiennes chez le cheval." O. NAVÉZ. *Ibid.* Nos. 3-4. March-April 1919. Pp. 94-108.

1. In the *Annales vétérinaires* for 1913 Navez called attention to the fact that a considerable number of horses, particularly those of the heavy type, may have unilateral muscular atrophy of the larynx without presenting any sign of "roaring." He now returns to the subject, and examines separately the two clinical manifestations of laryngeal hemiplegia, namely, "roaring" and dyspnœa. His latest researches have been conducted partly on the dead subject and partly on seven horses in which muscular paralysis had been artificially produced by section of the recurrent nerve. In the living experimental animals, examination of the interior of the larynx was effected by means of the rhino-laryngoscope of Leiter, which, when introduced through one of the nasal cavities, permits a clear view of the epiglottis, the aryteno-epiglottic folds, the arytenoid cartilages, the vocal folds, the entrance to the laryngeal ventricles, and even of the infraglottic part of the laryngeal cavity.

The author first examines the theory that "roaring" and dyspnœa are due to distension of the ventricle. As the result of his observations he affirms that neither of the symptoms of laryngeal hemiplegia in the horse is due to distension of the ventricle of the paralysed side. He next discusses the theory that the symptoms are due to the displacement of the arytenoid cartilage of the paralysed side under the influence of thoracic aspiration (inspiration). He concludes that the dyspnœa is partly due to defect in dilatation of the entrance to the larynx consequent upon immobility of the arytenoid cartilage (that is, paralysis of the dilator muscle); partly due to displacement of the arytenoid

cartilage towards the median plane during inspiration (this is particularly noticeable in young animals); but mainly due to the contraction (or contracture) either of the constrictor muscles of the paralysed side when the hemiplegia is incomplete, or of the healthy part of the transverse arytenoid muscle when the hemiplegia is complete. In the adult horse, in the absence of this spasmotic contraction of the constrictors, the dyspnoea may be insignificant and pass unperceived. Thoracic aspiration (inspiration) *by itself* is incapable of producing displacement of the arytenoid cartilage and the vocal fold of the paralysed side in a degree sufficient to produce the dyspnoea and "roaring."

Narrowing of the laryngeal cavity is most marked on a level with the glottis, and it is here that "roaring" and dyspnoea have their origin.

When a horse suffers from dyspnoea, particularly if the animal is of the heavier type, even though there is no "roaring," the presence or absence of hemiplegia should be determined by the laryngoscope. If laryngoscopic examination confirms the diagnosis of hemiplegia, Williams' operation should be performed.

In the Williams operation, after extirpation of the ventricle, it is well, especially in heavy horses, to lacerate the connective tissue about the pouch in order to obtain a firm arytenoidopexy. The author believes that, in cases of incomplete hemiplegia, the Williams operation might profitably be followed by section of the recurrent nerve of the paralysed side.

2. Navez has made a series of microscopic examinations for the purpose of determining the condition of the muscles in cases of laryngeal hemiplegia. The specimens he has examined fall into four groups: (1) without apparent atrophy; (2) from non—"roarers" with slight atrophy; (3) from non—"roarers" with more or less complete atrophy; and (4) from "roarers" with more or less complete atrophy. He has also observed the lesions induced by section of the recurrent nerve.

In horses affected with laryngeal hemiplegia, whether they be "roarers" or not, the muscles are the site of a simple atrophy with an interstitial lipomatosis. There is no fatty degeneration of the atrophied muscles. The lesions of naturally acquired hemiplegia are identical with those that follow section of the recurrent nerve. The evolution of muscular atrophy of the larynx of the horse, following section of the recurrent nerve, appears to be somewhat slow.

The nature of the muscular lesions in laryngeal hemiplegia points to a neuropathic origin. The absence of fatty or other degeneration in the muscular fibres seems to eliminate infections or intoxications as a cause, and supports the supposition that the hemiplegia arises in

consequence of a traumatic lesion of the recurrent nerve. It appears to confirm the theory that the initial cause is tension on the nerve as it bends round the aorta.

CHRONIC ARTHRITIS OF THE FEMORO-TIBIAL ARTICULATION IN CATTLE
(Die chronische Hinterkniegelenksentzündung beim Rind). A.
HÜBSCHER. *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI.,
Nos. 7-8. July-August 1919. Pp. 275-285.

From the clinical as well as from the pathological point of view, it is possible to distinguish three forms of arthritis as affecting the femoro-tibial joint of cattle. (1) Serous arthritis is the most common form of the affection. (2) Hyperplastic arthritis is least common, and usually unilateral when it does occur. (3) Dry arthritis affects aged milk cows.

The serous form of arthritis begins gradually, and is rendered noticeable by increasing symptoms of lameness. There is pain in the joint, now severe, now less acute, now in one limb, now in the other. The joint is swollen as the result of the accumulation of fluid within it: the swelling is soft, elastic, and fluctuating. Muscles in the neighbourhood of the joint, particularly the anterior portion of the biceps femoris and the lateral head of the quadriceps femoris (lateral vastus), undergo atrophy. The appetite diminishes and the flow of milk is reduced, and there is finally emaciation and decubitus. Given good nursing and early treatment, the author agrees with Strebler and others that prognosis is favourable. Possibly 90 per cent. of cases may result in complete recovery.

Hyperplastic and unilateral arthritis is characterised by rapid development. There is marked lameness and intense pain on either passive or active movement of the joint. The swelling is hard, and muscular atrophy early makes its appearance. Later, atrophy takes place in the middle and superficial gluteus, the semitendinosus and tensor fasciae latae muscles and in the lateral head of the gastrocnemius. Not rarely there is muscular contracture and the joint is held in a position of partial flexion, so that the toe of the foot alone can be placed on the ground. Rapid emaciation, diminution in the flow of milk, loss of appetite, weakness and decubitus follow. The author is of the opinion that, with early and appropriate treatment, 65 to 70 per cent. of cases of hyperplastic arthritis may end favourably.

The dry form of arthritis is oftenest seen in aged milk cows. The commonest symptom is pain in the joint, of varying degree and intensity, most marked in spring and autumn when the weather is unfavourable and wet. Crepitus can be heard on movement of the joint. The

condition may continue for a long time, and the prognosis is not particularly good.

In discussing the etiology of arthritis, Hübscher states that he has very frequently found the condition in cattle housed in newly-built, damp byres with cement floors. He is evidently of the opinion that unhygienic housing is an important factor in etiology. Another very important factor is individual predisposition, which may be accentuated by forcing the cow in order to increase the production of milk.

In the treatment of the serous and milder hyperplastic forms of the disease, Hübscher recommends the vigorous application, twice daily, of a mixture of equal parts of ichthyolvasogen 20 per cent., chloroform, and turpentine. As a substitute for ichthylol, ichthyopon or isarol may be used. If there is no improvement in the course of a few days, biniiodide of mercury and cantharidis ointment should be applied, or point-firing may be resorted to.

NASAL "HORNS" OF TRAUMATIC ORIGIN IN THE OX, SHEEP, AND GOAT
(Les cornes nasales d'origine traumatique chez le bœuf, le mouton et la chèvre). CURASSON. *Rec. Méd. Vét.*, Paris. Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 15th May 1919. Pp. 182-186. 2 Figures.

In 1880 de Rochebrune ("Sur une race de bœufs domestiques observée en Sénégambie," *C.R. Acad. Sci.*) described a race of cattle in the Soudan in which he thought that a nasal horn was a constant character, and to which he gave the specific name of *Bostriceros* in consequence. Later observers have been of the opinion that the nasal "horn" is the result of the native practice of inoculation against peripneumonia. Others, while admitting the traumatic origin of the "horn," have associated it with a native method of preventing the young from sucking after the time of weaning. To wean the young calf, lamb, or goat, it is the custom to make an incision through the skin on the bridge of the nose. If the incision is not sufficiently painful to serve its purpose, or if it heals too rapidly, it is dressed with various irritant substances. Curasson has had the opportunity to examine a number of the so-called nasal horns, and finds support for the view that they result from wounds inflicted for the purpose of preventing sucking of the mother. That they are not to be looked upon as caused by inoculation against peripneumonia is clear from the fact that they occur in the sheep and goat, in which inoculation is not practised. The incision and irritation evidently lead to a productive osteitis and thickening of the overlying epidermis. The size of the "horn" varies, not only in different species, but also in different

individuals of the same species; and its size may be taken as an indication of the extent and depth of the incision, the length of time inflammation lasted, and the number of times the incision was made.

The texture of the bony basis of the "horn" is generally spongy, with an irregularly alveolar structure, and reveals the inflammatory origin of the growth. Sometimes the bone is hard and dense; and frequently a bony basis of the "horn" is absent. If a bony outgrowth is absent, its place is taken by firm fibrous tissue. The horny tissue is not fibrous like that of the true horns, but is irregular and scaly as in an ordinary hyperkeratosis.

TOXICOLOGY.

OAK-LEAF POISONING OF DOMESTIC ANIMALS. A. D. MARSH, A. B. CLAWSON, and H. MARSH. *Bull. No. 767.* Professional Paper, U.S. Dept. Agric. 28th April 1919. Pp. 36. 19 Figures.

While literature on acorn poisoning is extensive, publications on poisoning by oak leaves are few. In addition to the experimental work hereunder summarised, this paper gives a review of the literature on the subject and Cornevin's writing *in extenso*. From some of the Western States there have been many complaints based on the belief that oak leaves are toxic to cattle, and heavy losses are said to have been caused in some localities. Most of the trouble has been ascribed to two species of oak, *Quercus gambelii* and *Q. havardii*, the latter being known in Texas and New Mexico as "shinnery oak." Most cases of poisoning seem to occur in the spring, the animals in poor condition being affected, while those that are well fed escape.

The Department of Agriculture made an exhaustive inquiry into the matter and made feeding experiments during four summers.

In the shinnery country the statement is often made that as soon as shinnery starts growth in the spring cattle will leave all other food, even refusing hay, and eat the oak. This idea is wrong. The oak is the first thing to start growth in the spring, and comes at a time when other food is practically exhausted; the cattle have existed for a long time on hard dry food and look for something green, and therefore eat largely of the oak leaves and buds. The findings of the experimental work are summarised as follows. Continuous feeding on oak leaves may produce sickness which sometimes has a fatal termination. Only a small percentage of the animals on a range are injured. The specially marked symptoms are constipation, faeces containing mucus and blood,

emaciation, and oedema. A diet composed exclusively of oak leaves does not form a sufficiently nutritious diet to permit normal gains in weight. Oak leaves with a small quantity of other food may provide a maintenance diet. It has been found experimentally that as small a quantity of alfalfa hay as three pounds daily will supplement the oak for this purpose. Oak leaves may produce injurious effects at any season; most of the cases, however, occur in the spring because on the range at that time there is a scarcity of other forage, and oak leaves are then attractive. While cattle later in the season eat largely of the oak, more or less other forage is available and no harmful results are experienced.

(R. G. L.)

THE CHEMICAL EXAMINATION OF THREE SPECIES OF LARKSPUR,
DELPHINIUM BARBEYI, *DELPHINIUM GLAUCESCENS*, *DELPHINIUM GEYERI*. O. A. BEATH. Bull. No. 120. Univ. Wyoming Agric. Exp. Station. June 1919. Pp. 55-88. 11 Figures, 4 Charts.

The physiological action of delphinin, the active principle of larkspurs, has been extensively studied, with varying results. There is, however, close agreement on the chief symptoms. The muscular tremblings, starting in the abdominal muscles and passing over the body generally, appear to be characteristic of larkspur poisoning. Hahn (*Dictionnaire encyclopédique des sciences médicales*, 1882, xxvi. 523-543) sums up the chief symptoms in the following words:—"The delphinin, after having caused a local irritation, which is not intense in the first stages, manifests its action on the respiration (slowing of the respiratory movements, death by asphyxiation), on the organs of circulation (slowing of the beating of the heart, lowering of the blood pressure, stopping of the heart in diastole), on the spinal cord (loss of the excito-motor power of the spinal cord, rapidly progressive general anesthesia, convulsions and paralysis); moreover, the muscles are the seat of intense fibrillar shocks. In its toxic effects delphinin, then, very much resembles the alkaloids of aconite, as one would expect from the botanical relationships; it is distinguished by its energetic action on the nerves supplying the muscles, an action which aconitin does not possess except in a feeble degree."

Delphinium barbeyi and *D. geyeri* cause heavy annual loss of cattle: *D. glaucescens* is not toxic enough to cause any harm unless eaten in large amounts. The author of the present paper notes that the first abnormal condition is an inability to walk naturally. Sometimes, and especially in acute stages of poisoning, an animal will drop suddenly. "Frequently a drove of cattle may appear to be grazing in a perfectly

normal manner, and if they are frightened or driven hurriedly for a few minutes, individuals will fall which previously had shown no apparent uneasiness. After an animal falls from larkspur poisoning, the characteristic symptoms of nausea, weakness, excessive salivation, pronounced sweating, twitching of the muscles of the sides and legs, and convulsive movements are usually observed. . . . The immediate cause of death in larkspur poisoning is due to respiratory paralysis; the heart action is retarded considerably and stops about as soon as respiration ceases."

"The low larkspur, *D. geyeri*, resembles *D. barbeyi* in regard to similarity of amorphous alkaloids. The closely related aconitic acid entering into combination with crystalline bases to produce the principal toxic amorphous alkaloid is a notable resemblance. On the other hand, the crystalline alkaloids of *D. geyeri* are distinctive and in no way show any similarity to the bases of *D. glaucescens* and *D. barbeyi*. From a chemical point of view, therefore, the three species vary in many respects."

The best form of treatment in cases of larkspur poisoning is that outlined by the Bureau of Animal Industry (*Bull. 365*), which consists of the intravenous injection of physostigmin salicylate 1 grain, pilocarpin hydrochloride 2 grains, and strychnin sulphate $\frac{1}{2}$ grain: these doses being for an animal weighing 500 to 600 pounds.

REPORTS.

NIGERIA. ANNUAL REPORT OF THE AGRICULTURAL DEPARTMENT,
NORTHERN PROVINCES, FOR THE YEAR 1918. Appendix I.,
Report of the Veterinary Department (F. R. BRANT, M.R.C.V.S.)
for the Year 1918. Pp. 7-13.

Though several outbreaks of rinderpest were reported in the provinces of Zaria and Kano, few reports were received from other provinces. It is probable that, as the result of the comparatively serious outbreaks in 1915 and 1916, a large number of cattle are immune to the disease. Native cattle-owners do not pay much attention to a disease that affects only a small percentage of their herds, and it is quite likely that rinderpest is smouldering in many herds without being reported. From reports from several provinces, it is evident that pleuro-pneumonia has a firm hold throughout the country, and is the cause of a heavy annual loss. For the present, the native method of inoculation in the face should not be discouraged; it has its drawbacks, but it tends to curtail the outbreak, and those animals that recover from the inoculation have a considerable degree of immunity. Foot-and-mouth disease is fairly prevalent throughout the country. The native owners of cattle accept it (as they do many other diseases) as the "will of Allah."

In respect of trypanosomiasis, the definite location of individual fly-belts will take years, and will require a considerable staff; but, in addition to known tsetse-infected areas in Sokoto, Kano, Bauchi, and Bornu, most of the country south of a line drawn east and west from about twenty miles south of Zaria must be regarded as probably fly-infested, especially in the rainy season.

Hæmorrhagic septicæmia was reported from Allagerno in Bornu province, and reports of a disease suggestive of this were received from Bauchi province. Among the diseases which are suspected to exist in the country are blackquarter, anthrax, and tick-borne diseases; but without a laboratory and an adequate veterinary staff it is doubtful if much headway will be made in discovery and investigation of these and of obscure diseases.

Relative to intestinal parasites, it was found that a number of sheep in Kaduna were heavily infested with *Hæmonchus contortus*, and some goats running with these sheep were badly infested with *Tænia*.

Epizootic lymphangitis is widespread among horses, chiefly because of the carelessness of native owners. The type of disease is mild compared with that occurring in other parts of Africa, and spontaneous recovery is not uncommon.

SOUTHERN RHODESIA. REPORT OF THE CHIEF VETERINARY SURGEON
(J. M. SINCLAIR, M.R.C.V.S.) FOR THE YEAR 1918. Salisbury,
Rhodesia: Printed by the Government Printer. 1919. Pp. 7.

During the year under report, the number of fresh outbreaks of African coast fever was 5, with a mortality of 374, as compared with 13 and 438 respectively during the previous year; and generally the position in regard to this disease is more favourable than it has been for many years past. The draft Cattle Cleansing Ordinance, recommended by the Committee of Enquiry on Coast Fever which sat in 1917, was passed by the Legislative Council with certain amendments suggested by the Agricultural Union, and has become operative in all areas to which the provisions of the Compulsory Dipping Ordinance, 1914, had been previously applied.

"A considerable mortality, in young stock chiefly, occurred from gall-sickness on farms where dipping has been practised for a number of years, and stock-owners are apprehensive lest this should become a seasonal occurrence if regular and proper dipping is maintained. There is no doubt that dipping prevents the establishing of that degree of immunity against gall-sickness and redwater which is necessary to protect cattle when exposed to free tick infestation, but when stock contract gall-sickness and die on farms where dipping has been regularly carried out for a number of years, the position is admittedly serious, and merits attention with the object of providing a remedy. The form of gall-sickness referred to is technically termed 'anaplasmosis,' and is transmitted by ticks, and as there is no suggestion or evidence of any other vector, one is naturally led to enquire as to the effectiveness of dipping on the farms where this mortality occurred. The best test of the effectiveness of dipping is the presence or absence of ticks. It is beyond dispute that regular and proper dipping results in the reduction of tick life to a minimum, and that immunity to gall-sickness is correspondingly reduced has been amply demonstrated by the heavy mortality which occurred in several instances where cattle which had been regularly dipped were removed to veld where dipping facilities did not exist. On several farms on which the mortality referred to occurred, it is admitted that ticks had increased enormously during the latter part of the year; indeed, in one case the owner states that, excluding the blue variety, there were more ticks on his cattle than when he started dipping some seven or eight years previously. With these admitted

facts before us, it is reasonable to assign the mortality from gall-sickness on farms where dipping is carried out to the increase in tick life, as the result of dipping in solutions of ineffective strength."

The germ-free filtrate, as introduced by Naoshi Nitta, of Tokyo, for immunisation against blackleg, is to be tried in Southern Rhodesia.

A report by the Government Veterinary Bacteriologist (Ll. E. W. Bevan, M.R.C.V.S.) is appended to the report of the Chief Veterinary Surgeon. A few outbreaks of trypanosomiasis have been detected, and many hundreds of doses of arsenic-antimony injection have been issued and applied with satisfactory results. This treatment, however, does not effect a cure, but enables a large proportion of animals to acquire a tolerance to the trypanosome comparable to that occurring in cattle and dogs to piroplasmosis after treatment with trypan-blue.

Results so far seem to hold out promise that some measure of success will attend the Government Bacteriologist's method of inoculation against horse-sickness.

BOARD OF AGRICULTURE AND FISHERIES. ANNUAL REPORT OF THE CHIEF VETERINARY OFFICER (SIR STEWART STOCKMAN) FOR THE YEAR 1918. London: Published by His Majesty's Stationery Office, 1919. Pp. 12. 3d. nett.

Much of the matter contained in this Report has already appeared in an earlier publication (*Annual Report of Proceedings under the Disease of Animals Acts, etc., for the year 1918*; see this *Review*, 1919, III. 337), but additional facts relative to the outbreak of rabies are now submitted. "When the Board took charge of the outbreak in Devon and Cornwall the position was serious owing to the length of time the disease had been lurking undiscovered. Two important fortuitous circumstances, however, aided the operations. Firstly, the majority of the cases were of the paralytic form, which greatly curtailed their wanderings and their ability to bite; and, secondly, the majority of cases which ran elected to take a westerly direction, and by so doing came up against an effective sea barrier. . . . Leaving out the earlier cases, about which the Board had only circumstantial evidence, the number actually arising between the 30th August, when the first case was diagnosed at the laboratory, and the 31st December was 112." Much valuable and interesting information has been accumulated at the laboratory respecting methods of rapid and accurate diagnosis. This information it is proposed to deal with at another time. From information forthcoming during the period under report on the incubation period of those cases in which it was possible to establish the infecting bite with reasonable accuracy, it appears that the interval intervening between infection and the appearance of symptoms in five dogs ranged from 24 days to seven and

a half months. In six bovines the interval intervening between the infection and the appearance of symptoms was 22, 23, 27, 27, 34, and 84 days respectively.

"The distances covered, as the crow flies, during their run in the case of eight dogs, about which reasonably accurate information was available, were as follows:—In one case 20 miles, but the dog was shot while still going strong because it bit a man; in another case eight miles, but it was then shot because it had bitten two men and seven dogs; in another case 20 miles, when it was shot; in another case 12 miles, when it was captured by a policeman whom it bit—it died in captivity; in another case 22 miles, when it was captured and shot for attacking ducks; in another case 30 miles, when it was shot while still going strong; in another case 12 miles, when, after biting ten people, it returned to its home and died two days afterwards; in another case 30 miles, and died exhausted."

BOARD OF AGRICULTURE FOR SCOTLAND. AGRICULTURAL RETURNS FOR SCOTLAND, 1919.

This is a preliminary statement for 1919, compiled from returns collected on the 4th June.

"The live stock returns show that the numbers of horses and cattle have slightly increased during the year, the number of pigs has considerably increased, and the number of sheep has considerably decreased. Horses used for agricultural purposes are more numerous by 3141, or 2·3 per cent., and 'other horses' by 711, while unbroken horses are fewer by 627, the net increase thus amounting to 3225, or 1½ per cent. Cows in milk are more numerous by 15,961, or 4·6 per cent., while cows in calf have decreased by 7850, or 14·9 per cent., and heifers in calf by 5125, or 9·6 per cent. The total number of breeding and milking cattle has thus increased by 2986. Other cattle of two years and above have increased by 29,493, or 13½ per cent., while those of one year and under two and those under one year have decreased by 10,397, or 3½ per cent., and 3085, or 1¼ per cent., respectively. All these movements are in the opposite direction to those which took place in 1917-18. The whole number of cattle has increased by 18,997, or 1·6 per cent. Breeding ewes are fewer by 193,984, or 6·4 per cent., and lambs by 370,747, or 13½ per cent., while other sheep of one year and above are more numerous by 82,227, or 7·7 per cent. Sheep as a whole are thus fewer by 482,504, or 7 per cent., the total being the smallest on record. Sows kept for breeding have decreased by 904, or 5·6 per cent., while other pigs are more numerous by 10,526, or 9·4 per cent., the net increase amounting to 9622, or 7½ per cent. Separate returns have been obtained this year for the first time of bulls, rams, and boars. These number 19,208, 80,773, and 1712 respectively."

REVIEWS.

THE EARLY HISTORY OF VETERINARY LITERATURE AND ITS BRITISH DEVELOPMENT. By Major-General Sir FREDERICK SMITH, K.C.M.G., C.B. Vol. I. From the Earliest Period to A.D. 1700. London : Baillière, Tindall & Cox. 1919. Pp. iv + 373. 25s. nett.

No member of a profession can fail to be advantaged by some knowledge—the more the better—of the history of the literature of his calling. For a means to make ourselves familiar with the early history of veterinary literature we have to thank Sir Frederick Smith, whose enthusiastic and patient research resulted in a series of articles that appeared in the *Journal of Comparative Pathology and Therapeutics* from 1912 to 1918. These articles have been gathered together and now lie before us in the shape of a book of surpassing interest. However much we may have been impressed with the evidence of patient labour borne by the original articles, admiration—in the primary sense of the word—is compelled when they are regarded in a collected form. One thing we regret—and the author, we are sure, regrets it also—and that is that the war interfered with a more thorough revision and, possibly, some measure of reconstruction of the articles before they were issued as a volume. We feel sure that, had time not been so precious, the author would have corrected the bibliographical error of omitting the original titles of books to which reference is made. Much more, however, do we regret that the war has postponed the writing of the second volume of this history, which, we are given to understand, will cover the period from 1700 to the middle of the nineteenth century. We trust that, now that the war is a thing of the past, Sir Frederick may find leisure in which soon to complete his laudable task.

Where so much is good it is not easy to assess relative values. We have the temerity, however, to think that the best part of the whole volume is that in which the name of Michael Harward is rescued from obscurity, if not oblivion. By this alone, the author has earned the gratitude of all who are interested in the history of veterinary literature and the veterinary profession. Among his claims to be remembered, it seems more than likely that Harward was the pioneer in intestinal surgery ; for his book, in which the following passage occurs, was published in 1673.

"Then if there be any torn along the guts, or else jagged, that may not be stitched together for it will not grow, neither will that which is black, cold, and dead, in which case thou must do this. First, lay the

two broken ends that should grow together the one a little over the other in your hand ; then cut them both off at once with a pair of scissors, so that the new cut ends may be joined close together, but first cut the two broken ends off close to the mid-rise [mesentery] and cast them away, then with a fine needle and thread, or silk, stitch the two new cut ends together so that they may gently meet and not be strained. Begin first to stitch at the mid-rise [mesentery] and so round about the gut till you come to the same place again and then make fast your thread. But in this stitching remember this that as you must not draw your seam too hard for fear of crushing that tender skin, neither must you leave it too slack for fear the dung issue out, for if you miss either way you are sure to fail in your cure. When you have stitched the gut ends together with a fine and thick [close] seam and wiped away the blood and dirt clean, then anoint it with hog's grease and the juice of Comfrey mixed. This done put the guts into the belly and stitch up the breach, first the inner side [peritoneum] then the middle [muscles] and then dress with moulten butter and stitch up the outermost skin as is taught before, and use the beast as in the former cure, only do this more, that is, give him the juice of Comfrey in strong ale or beer to drink, and if he dung and stink two or three days, there is no doubt of the cure. But in both these cures be sure of good help and be quick at thy work and careful withal."

Harward was not merely an enthusiastic and intrepid surgeon : he was an inspiring preceptor.

"Be sure thou have an accurate and ready head, a good memory and an active and nimble hand, together with resolution and boldness, yet careful and vigilant, not rash nor hasty. If thou wantest these qualifications thou art not fit to administer physic much less to perform chirurgical operations."

HEREDITY. By J. ARTHUR THOMSON, M.A., LL.D., Professor of Natural History in the University of Aberdeen. Third Edition. London : John Murray. 1919. Pp. xvi + 627. 15s. nett.

MENDELISM. By REGINALD CRUNDALL PUNNETT, F.R.S. Fifth Edition. London : Macmillan & Co. 1919. Pp. xv + 219. 7s. 6d. nett.

LECTURES ON SEX AND HEREDITY. By F. O. BOWER, J. GRAHAM KERR, and W. E. AGAR. London : Macmillan & Co. 1919. Pp. vi + 119. 5s. nett.

Though there is much ground for debate on a number of questions relative to heredity, progress towards the solution of many problems is slowly but surely being made. And although the fact that many questions relative to heredity as it affects mammals are still unanswered detracts somewhat from the practical application of laws to the science of breeding, it is none the less necessary that the breeder, if he wishes to forsake pure rule-

of-thumb methods, must be acquainted with the facts of heredity so far as they are at present known. The veterinary practitioner, no less than the breeder, ought to know what has so far been discovered, and more particularly such facts as have been ascertained relative to the bearing of heredity upon disease. Heredity in its relation to "unsoundness" is of every-day importance; as is, although in a lesser degree, the influence of heredity upon predisposition to diseases in general. All the three books now before us will be of service in this connection, and should find a place on the shelves of the practitioner.

The book by Professor J. Arthur Thomson, now in a third edition, has amply fulfilled the primary aim of its author, namely, to serve as an introduction to the study of heredity, wherein ascertained facts and recent discoveries should be expounded in a comprehensive and accurate, and yet relatively simple manner. The demand for a new edition has afforded an opportunity of correcting some errors, and of incorporating new discoveries that have been recently made in this progressive department of Biology.

Professor Punnett's book deals solely with those ascertained facts of heredity that have come to be so widely known by the specific term Mendelism. There are those who are very pessimistic regarding the possibility of the beneficial application of Mendelism to the breeding of animals, and in some measure their attitude is justified. Nevertheless, Mendelism is not to be neglected by the breeder of live-stock, for though, as Professor Punnett admits, the application of its principles is likely to be of more immediate service for plants than for animals, there are many directions in which Mendelism may be of use to the animal breeder.

"It affords the breeder a rational basis for some familiar but puzzling phenomena. The fact, for instance, that certain characters often 'skip a generation' is simply the effect of dominance in F_1 , and the reappearance of the recessive character in the following generation. 'Reversion' and 'atavism,' again, are phenomena which are no longer mysterious, but can be simply expressed in Mendelian terms. The occasional appearance of a sport in a supposedly pure strain is often due to the reappearance of a recessive character. Thus, even in the most highly pedigreed strains of polled cattle, such as the Aberdeen-Angus, occasional individuals with horns appear. The polled character is dominant to the horned, and the occasional reappearance of the horned animal is due to the fact that some of the polled herd are heterozygous in this character. When two such individuals are mated, the chances are 1 in 4 that the offspring will be horned. Though the heterozygous individuals may be indistinguishable in appearance from the pure dominant, they can be readily separated by the breeding test. . . . To ensure that no horned calves should come, it is enough to use a bull which is pure for that character. This can easily be tested by crossing him with a dozen or so horned cows. If he gets no horned calves out of these he may be regarded as a pure dominant and thenceforward put to his own cows,

whether horned or polled, with the certainty that all his calves will be polled. Or, again, suppose that a breeder has a chestnut mare and wishes to make certain of a bay foal from her. We know that bay is dominant to chestnut, and that if a homozygous bay stallion is used a bay foal must result. In his choice of a sire, therefore, the breeder must be guided by the previous record of the animal, and select one that has never given anything but bays when put to either bay or chestnut mares."

The small volume on *Sex and Heredity* is the outcome of a series of six lectures delivered by Professors Bower and Graham Kerr and Dr. Agar in Glasgow during the academic year 1917-18. The object of the lectures, we are informed, was to set forth the leading facts of the subject in as simple terms as possible; and the lecturers very successfully attained their aim. Indeed, the only criticism one feels inclined to make is that the attainment was, if anything, too successful: for there is the danger that the reader of the lectures may come to the erroneous conclusion that the subject presents few difficulties or complexities.

VIOUS CIRCLES IN DISEASE. By JAMESON B. HURRY, M.A., M.D.
Third and Enlarged Edition. London: J. & A. Churchill. 1919.
Pp. xx + 377. 15s. nett.

The first edition of Dr. Hurry's book appeared in 1911, and a second edition was published in 1913. Thus there was a clear indication that the book dealt with a subject that appealed to medical readers. The third edition, now before us, has undergone extensive revision, and much of it has been re-written. The edition also forms a larger volume than its predecessors, inasmuch as it has been found necessary to add nine fresh chapters. One of these, we are glad to note, deals with veterinary diseases; and this, we feel sure, will make the picture of vicious circles more complete. Readers of the *Veterinary News* will remember that the author contributed an article on "Veterinary Diseases and the Vicious Circle" to that periodical in 1918. The chapter in the current edition of his book is based on that article.

SIR WILLIAM TURNER, K.C.B., F.R.S. By A. LOGAN TURNER. Edinburgh
and London: William Blackwood & Sons. 1919. Pp. xv + 514.
18s. nett.

"Turner, in his capacity as Chairman of the Administrative Board of the College, devoted considerable attention to its affairs. . . . He was desirous of raising the character of the teaching imparted, and he took a great deal of trouble in seeing that efficient teachers were appointed upon its staff. When the movement was initiated for the erection of the College new buildings in Hope Park Crescent, he used his influence in obtaining money for that purpose. . . . The new Royal (Dick) Veterinary College has now been completed. A fresh lease of life has been given to it. The status of veterinary

science in Scotland has been elevated by receiving the hall-mark of a University degree, and the future of the profession presents a brighter outlook. Much of this it owes to Turner's personality and his zeal on its behalf."

But this is not the only reason why Sir William Turner's name should be included in the list of those who have helped to advance veterinary science. His was certainly the moving spirit and his the guiding hand in the fundamental changes that took place in the government and development of the Edinburgh veterinary school early in the present century. But his connection with and influence upon the teaching of veterinary science dates farther back. From 1873 to 1882 he was a member of the Board of Examiners of the Royal College of Veterinary Surgeons. He was a friend of Professor Strangeways. Three successive Edinburgh teachers of veterinary anatomy, occupying collectively this position for about forty years, were pupils of Turner, and from him received inspiration and example. Thus for about half a century Turner had a close, if unobtrusive, influence upon a certain fundamental section of veterinary education in Scotland.

Those who would discover at second hand what manner of man Turner was, and what his ideals and methods, cannot do better than read the story of his life as related by his son, who has performed his task in a thoroughly judicial fashion that close relationship must have made none too easy. Dr. Logan Turner has succeeded in avoiding the numerous pitfalls that lie in the path of dutiful sons when writing of illustrious fathers.

A TEXT-BOOK OF PATHOLOGY. By FRANCIS DELAFIELD, M.D., LL.D., and T. MITCHELL PRUDDEN, M.D., LL.D. Eleventh Edition, revised by FRANCIS CARTER WOOD, M.D., Director of the Pathological Department, St. Luke's Hospital, New York, and Director of Cancer Research, Columbia University, New York. New York: Wm. Wood & Co. 1919. Pp. vi + 1354. \$7.50.

Whatever difference of opinion there may be as to the existence of a judgment after death—and there are people who think the judgment comes first—there is general agreement that it is appointed unto men once to die.

The upright man need not fear death; but the approach thereto may well appal the stoutest heart. Some there are who pass away as quietly as the streaks of morning cloud of which Professor Tyndall spoke. And in any case there is this consolation: when the ultimate crisis does come we are mostly unaware of it; even as we do not know just when we fall asleep to wake again, neither do we know just when we sleep to wake no more.

As the shadows of our life lengthen and the veil becomes more transparent our premonitions materialise; we become fearfully aware of the presence in our chamber of those *Chained Tigers* of the poetess which but wait their chance to spring. But much may happen before that consummation. If we go down to the potter's house we may see vessels, some appointed to honour, and some marred in the potter's hand. If we turn to Chap. X. of the eleventh edition of Delafield's and Prudden's well-known

Text-Book of Pathology we shall find illustrations of vessels marred in the making—pictures which will prepare us for the yet more distressful revelations in Professor Adam's *Principles of Pathology*, and in Professors Hirst's and Piersol's *Human Monstrosities*.

Somewhere in Britain there is a frail child who plays listlessly with her more robust companions, amidst whom she appears as a lily set among roses. *She is waiting to go into a sanatorium*, but whether because of parental thoughtlessness, or because some of her fellow-creatures were careless in the disposal of their expectorates, or because some cow, foully housed, was overworked as well, who can say? Questions such as these will come some time to be answered by the readers of this text-book. The problems of pathology are more than pathological problems, and when we have amassed our knowledge we still have to make use of it. So long as our philosophy is a thing of brass with feet of clay the world will cast an indulgent eye upon our toy; but if it be galvanised into life, and strike at prejudice or war with convention, if it say plainly *You must be better for your children's sakes*, offence is given and stones are sought. The White Plague penetrates peacefully, causing at first little local and less general disturbance—indeed, its presence is only known to the cells in its immediate neighbourhood, and possibly to the intelligence department of the body. The reaction of the body in some measure depends on the action of the invading germ: if the action be slow the reaction is leisurely; the local defensive forces are mobilised, presently reinforcements arrive; action is taken and reaction results; ruin follows in the wake of war; later, the scene of the conflict is shifted to another area, and all that remains locally is a heap of dead over which Nature may cast a handful of ashes, and around which she may build a fence. But the pathologist must be more than a historian of ruins, and Necessity is constantly pressing the test-tube into his hands.

Strongly bound, clearly printed, and with a lucid text, the size of this book should not affright the student: works such as this may be read with advantage as romance—no! not as romance, they are too real for that—well! as novels then, as though the title were: *The Ills that Flesh is Heir to* being Chapters in the Life of *Many A. Mortalman*, with some reflections on his father *Homo Sapiens* and some sidelights on a trouble to the family *L'Uomo Delinquente*. It is difficult to realise when perusing pages 304-312 of this book that we are reading of one of the vilest plagues which ever brought desolation to a happy home, but if in connection therewith we read Mr. A. Corbett Smith's articles on the same subject in the *Journal of State Medicine* for 1914, or *The Problem of the Nations* by the same author, we shall find that so it is; and we should so read, for the solution of the problem lies in the education of the individual, and pathology sometimes comes too late in the curriculum to be of use.

When engaged in studying the eight hundred or so beautiful illustrations in the book under review, the student may become gradually aware that he is looking often at pictures of fragments of some of his fellow-creatures who have already passed along the dolorous way at the end of which Death

stands. And there will perhaps grow up in him something of the awe which stirred the heart of old Sir Thomas Browne when gazing at what the opened urn revealed, for the true physician must still study Humanity in the University of the World ; and to those who, hoping some day to be such, but standing now at the commencement of their pathological studies, and who, in passing, may be congratulated upon having access to such a book as this edited by Dr. Carter Wood, we, students ourselves though of an earlier year, may appropriately address the words of the late Dr. Thomas Watson (*Lectures on Physic*) :—Surely, gentlemen, you will not dare, without adequate and earnest preparation, to embark in a calling like this ; so capable of good if rightly used, so full of peril to yourselves and to society if administered ignorantly or unfaithfully. And even when you have made it, as you may, the means of continual self-improvement, and the channel of health and ease to those around you, let not the influence you will thus obtain beget an unbecoming spirit of presumption ; but remember that, in your most successful efforts, you are but the honoured instruments of a superior power—that, after all, “It is God who healeth our diseases, and redecometh our life from destruction.”

(D. C. M.)

FOOD AND THE PUBLIC HEALTH. By WILLIAM G. SAVAGE, B.Sc., M.D.
Lond., D.P.H., County Medical Officer of Health, Somerset. London :
Cassell & Co. 1919. Pp. xi + 155. 5s. nett.

This book is one of the English Public Health Series, the professed object of which is to cater for and accentuate general interest in public health. Being written by the author of *Milk and the Public Health* is in itself considerable recommendation. But Dr. Savage has here been set a difficult task to deal fairly with such a subject in the small space at his disposal. A publisher's note on the cover-slip tells us that the author shows how little is being done at present to secure to the nation pure food and milk. It is in this connection that chief fault will be found with the book. The author would surely have treated the subject with greater fairness if he had at least given some indication of the vast amount of work that is being done to safeguard public health. Comparisons are striking, and it is probable that the book would have achieved greater success if the white had been placed alongside the black. While one welcomes his exposures regarding the disgusting private slaughter-houses, one cannot help thinking that the public would be more anxious to get rid of the evil if they realised that many enlightened cities employ a staff of highly trained veterinary inspectors whose constant duty is to ensure that every carcase exposed for sale is above suspicion. People who tolerate private slaughter-houses and the nauseous stuff that at times comes out of them do so largely because they are ignorant of the better conditions under which their more fortunately placed neighbours exist. Nevertheless, the chapter on meat foods contains some facts that it is well the public should know ; but the author detracts from its value when he tells us that animals affected with anthrax “die very quickly, with severe

and definite symptoms, so that there is small likelihood of the flesh being sold for food." It is of course the very absence of "severe and definite symptoms" that makes this disease so dangerous, and veterinary inspectors could tell of not a few anthrax carcases they have detected and retained for destruction.

The metaphysical hygienist—and there is a metaphysical aspect of hygiene—will wonder what will be the effect on the mind of the housewife who learns that sweets may contain arsenic derived from glucose ; cheap confectionery, arsenic in the shellac that covers it ; baking-powder may contain arsenic ; fruit may contain arsenic originating from insecticides. It is at least comforting to know that the man's beer may also contain arsenic : possibly doubt and fear may attack him too, as they surely will his wife.

It is difficult to understand why the author considered it necessary to drag in ergotism and lathyrism for a hundred-and-fifty-page book written for the populace of these islands.

(R. G. L.)

NOTES ON BOOKS.

FIRST LINES IN DISPENSING. By E. W. LUCAS, C.B.E., F.I.C., F.C.S., and H. B. STEVENS, F.I.C., F.C.S. Second Edition. London: J. & A. Churchill. 1919. Pp. iii + 182. 6s. nett.

This little work was written "primarily for students, nurses, and others whose calling necessitates an acquaintance with the art of compounding medicines." The authors do not make any pretence at completeness, and intend it to be understood that the book can only serve us an introduction to the subject of pharmacy. Nevertheless, to the veterinary student it will be found a very useful guide to his work in the dispensary, and as such can be recommended. Sections are devoted to the description of the various pharmaceutical operations, prescription writing, dispensing, etc. A chapter on mixtures, with special reference to the dangerous combinations which they may contain, is specially useful. Tables of synonyms, solubilities, poisons and their antidotes are added.

MAETERLINCK'S DOGS. By GEORGETTE LEUBLANC-MAETERLINCK. Translated by ALEXANDER TEIXEIRA DE MATTOS. London: Methuen & Co. 1919. Pp. xvi + 176. 6s. 6d. nett.

Some day someone will be moved to write a book on the dogs of famous personages. He will have a fascinating theme, and in producing his book will be compelled to consult the one now before us. He will then learn all about the diverse psychology of Louis the Debonnaire, Raymond the Clown, Achille the Impulsive, Adhémar the Misunderstood, Gaston the Highwayman, and—prince of his kind—Golaud the Superdog. Incidentally he will learn something of Maeterlinck and his wife. In the meantime, and until the future brings forth the much-to-be-desired volume, the dog-lover must be satisfied with *Maeterlinck's Dogs*, which he will be sure to enjoy. It is illustrated by the author.

BOTANY: A TEXT-BOOK FOR SENIOR STUDENTS. By D. THODAY. Second Edition. Cambridge: At the University Press. 1919. Pp. xx + 524. 7s. 6d. nett.

The second edition differs from the first, which appeared in 1915, by the inclusion of a section on Cryptogams. The additional pages, fifty in number, contain descriptions of the structure and life-history of representative algae, fungi, mosses and liverworts, and ferns.

NOTES ON HORSEMASTERSHIP. By Major R. C. TIMMIS, D.S.O., Royal Canadian Dragoons. London: Forster Groom & Co. 1919. Pp. 93. 1s. 6d. nett.

"The present times of high prices and dear labour should make us realise that the cheapest policy is to employ only the best horses, and the most knowledgable men to look after them."

HINTS ON HORSEMANSHIP. By Lieut.-Colonel M. F. M'TAGGART, D.S.O. London: Wm. Heinemann. 1919. Pp. xii + 167. 7s. 6d. nett.

ESSENTIALS OF PHYSIOLOGY. By F. A. BAINBRIDGE and F. ACWORTH MENZIES. Third Edition. London: Longmans, Green & Co. 1919. Pp. viii + 484. 12s. 6d. nett.

An account of vitamines has been added to this edition, and the chemistry of proteins has been revised in accordance with recent research. Hormones, antigens, and antibodies receive simple and lucid treatment.

SECRETS OF ANIMAL LIFE. By Professor J. ARTHUR THOMSON. London: Melrose. 1919. Pp. viii + 324. 7s. 6d. nett.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. By HOBART AMORY HARE, M.D., B.Sc., Professor of Therapeutics, *Materia Medica*, and Diagnosis in the Jefferson Medical College of Philadelphia. Seventeenth Edition, enlarged, thoroughly revised, and largely rewritten. London: Henry Kimpton. 1919. Pp. 1023. 28s. nett.

PROBLEMS OF FERTILISATION. By Professor F. R. LILLIE. (University of Chicago Science Series.) Chicago: University Press. London: Cambridge University Press. 1919. Pp. xii + 278. \$1.75.

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[A note on a paper under this heading does not preclude a fuller abstract in a later issue.]

ANATOMY (Including Embryology and Histology).

JOHNSON, F. P. "The Development of the Lobule of the Pig's Liver." *Amer. Journ. Anat.* Vol. XXV., No. 3. May 1919. Pp. 299-331. 28 Figures, 2 Tables.

LESBRE, F. X. "The Recognition of the Age of Calves" (Sur la connaissance de l'âge des veaux). *Rec. Méd. Vét.* Vol. XCV., No. 13. 15th July 1919. Pp. 395-405. 5 Figures.

WHITE, L. "Histogenesis of the Heart Muscle of the Pig in Relation to the Appearance and Development of the Intercalated Discs." *Amer. Journ. Anat.* Vol. XXV., No. 3. May 1919. Pp. 333-347. 2 Plates (18 Figures).

CLINICAL.

BOUCHET. "A Dental Anomaly that led to Fatal Hæmorrhage in a Horse" (Anomalie dentaire ayant entraîné la mort). *Rec. Méd. Vét.* Vol. XCV., No. 11. 15th June 1919. Pp. 320-322.

— "A Case of Verminous Colic" (Sur un cas de coliques vermineuses). *Rec. Méd. Vét.* Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 240-241.

BOUCHET, G. "Cases of Heart Disease" (Contribution à l'étude de la pathologie cardiaque). *Rec. Méd. Vét.* Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 259-263.

BOYD, W. L., FITCH, C. P., GRINNELL, C. D., and BILLINGS, W. A.
"Cavernous Hemangioma of the Liver together with Multiple
Adenoma of the Pancreas." *Cornell Veterinarian*. Vol. IX., No. 3.
July 1919. Pp. 169-170.

A ten-year-old Holstein cow suffered from capricious appetite and frequent periodic attacks of diarrhoea. "Emaciation and anaemia became progressive, the diarrhoea occurred at more frequent intervals, and at times there was partial or complete anorexia. . . . All the organs were found to be normal with the following exceptions. The liver was in a state of hypertrophic cirrhosis and filled with cavernous haemangioma, some of which were located on the surface, while others were deeply situated. These cavities varied in size from $1\frac{1}{2}$ to 4 cm., and were composed of spaces partially filled with corpuscles. The pancreas was studded with sharply circumscribed bodies, light grey in colour, varying in size from $\frac{1}{2}$ to $1\frac{1}{2}$ cm. These tumour-like structures were apparently encapsulated, and could be enucleated without difficulty. Microscopic sections of the pancreas were prepared, and a diagnosis of multiple adenoma was made. . . . The symptoms manifested by this animal were not unlike the symptoms that were observed in the case of pancreatic lithiasis which is reported in this journal." (See *Review*, 1919, III. 298.)

DESLEX, P. "Torsion of the Uterus in a Mare" (Torsion de la matrice chez une jument). *Schweizer Arch. f. Tierheilk.*, Zurich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 237-238.

This is the first case of torsion of the uterus in the mare that the writer has seen during 29 years' practice in a breeding district. The torsion was corrected by rotation with the animal on her back.

GOLDBERG, S. A. "Tubercular Encephalitis and Cerebro-Spinal Meningitis." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 313-318. 2 Figures.

A two-year-old Holstein heifer became paralysed, and evinced hyperesthesia over the whole abdominal region and back. There were tuberculous lesions in the meninges and brain tissue over the posterior part of the cerebrum. The spinal meninges were covered by a diffuse yellowish connective tissue growth, about 2 mm. thick, through the whole length of the cord. In addition there was evidence of tuberculous lymphadenitis and pneumonia.

GUPTA, S. K. "Traumatic Pericarditis with Effusion due to Swallowing of one Nail." *Vet. Journ.* Vol. LXXV., No. 8. August 1919. Pp. 57-58.

HODGKISS, J. R. "Psammoma of the Horse." *Vet. Journ.* Vol. LXXV., No. 8. August 1919. Pp. 43-44. 1 Figure.

Two cases are mentioned, and in each psammomata were present in both ventricles. Concerning one of the cases it is stated: "When she was being led she would suddenly 'rein back' without any apparent reason and then obstinately refuse to go forwards. In the stable she fed slowly, sometimes stopping in the act of chewing. She would permit her fore legs to be placed in unusual positions without attempting to replace them. Frequently she ran back in the stall, necessitating the wearing of a neck-strap to prevent injury. Her pulse was slow and regular, the pupil of the eye slightly dilated. During the whole time she was never observed pushing her head into a corner or attempting to climb the wall."

KERNKAMP, H. C. H., and BILLINGS, W. A. "Umbilical Hernia, Double Cryptorchidism, and Sacral Kyphosis in a Pig." *Cornell Veterinarian.* Vol. IX., No. 3. July 1919. Pp. 174-176.

L. R. C. "Hæmatoma of the Penis." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 226-227.

The penis of an Arab stallion was injured on a fence and hæmatoma was produced. When protruded, the penis inclined to the right. Under the anaesthetic effect of *Cannabis indica* the hæmatoma was opened and the clotted blood removed. The wall of the cyst was thoroughly scraped with a spoon curette, thoroughly syringed with a warm 5 per cent. solution of septico, dried, and iodoform dusted well into the opening. The result was satisfactory.

MILKS, H. J., and GOLDBERG, S. A. "Pseudo-Leukæmia in a Dog." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 436-443. 5 Figures.

"According to the history, the duration of this condition was apparently two months. It is possible, however, that the condition was unnoticed for a considerably longer period. . . . The spleen and the lymph glands were approximately 11 per cent. of the body weight of the animal. . . . In this case all the lymph glands were affected; they were not nodular, they were separate from each other, and not adherent to the surrounding structures. Leukæmia is ruled out on account of the normal blood picture. Tuberculosis and chronic productive lymphadenitis were excluded on microscopic examination. This leaves the only possibility, that of pseudo-leukæmia."

NEWSOM, I. E. "Scleroderma in Hogs." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 311-313. 2 Figures.

Three pigs were affected. "The disease was first manifested by a hardening of the skin over the shoulders and a rigidity of the tips of the ears. This

hardening continued down the ear until it had invaded the larger part of these organs, also over the back and part way down the sides of the animal. The process was very slow-going, and took probably three months to complete. At the end of this time there began a separation, noticed at the edges, and finally the whole scale, in some places 2 inches thick, sloughed off, leaving a bare, raw surface, but with practically no hemorrhage."

RULOT, L. "Generalised Cancer of the Lung in a Cow" (Lymphangite cancéreuse généralisée du poumon chez la bête bovine). *L'Echo Vet.*, Liège. Vol. XLVIII., No. 1. May 1919. Pp. 19-21.

SANCHEZ, I. B. "'Quittor' cured by the Bier Treatment" (Necrosis limitada o progresiva del fibrocartilago complementario de la tercera falange, curada por el metodo Bier). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 7. July 1919. Pp. 436-437.

A clinical note on a case of cartilaginous "quittor" in a mule that was cured by the passive congestion method of Bier. The congestion was induced by the application of an Esmarch bandage. During the first week the bandage was applied for two hours daily, but later the application was maintained for a longer time.

STADLER, H. "Emptying the Uterus" (Entleerung der Gebärmutter). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 238-240.

The author relates the good effect of expression of the corpus luteum and massage of the uterus in a cow in which there was a mummified fetus in the right cornu and the skeleton of another calf in the left cornu.

TUTT, J. F. D. "A Note on the Use of Adrenalin Chloride in Prolapse of the Uterus in a Mare." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 212-213.

"The uterus was replaced, and its interior swabbed out with a 1:1000 solution of adrenalin chloride. Straining ceased at once. The sudden cessation was quite remarkable, as the patient had been straining violently beforehand, but ceased to do so before the hand was withdrawn."

— "Laceration of the Vagina in Three Mares." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 225-226.

VAWTER, L. R. "Metastatic Melano-Sarcoma." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 664-666. 2 Figures.

A dog eight years old had nodular swellings on the prepuce. The inguinal lymph glands were also enlarged. Melanotic sarcomatous lesions were found in the prostate, the kidneys, the spleen, the lungs, and the bronchial and mediastinal lymph glands.

VAWTER, L. R. "Circulatory Filariasis." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 669-672. 2 Figures.

A male dog, four years old, presented symptoms of ascites, œdema of the hind limbs, anaemia, and difficulty in breathing. Post-mortem examination revealed a tangled mass of *Filaria immitis* in the heart, interfering with the closure of the right atrio-ventricular orifice, extending into the right ventricle, and thence following the lumen of the pulmonary artery into the right and left lungs.

WINTER, E. C. "Notes on Everyday Cases." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 213-216.

Deals with cases of retained placenta, strangles, purpura hæmorrhagica, foot injuries, and rig castration. In retention of the placenta the author is strongly of opinion that the usual procedure of forcibly removing the membranes is a mistake, as he gets the best results by flushing out the uterus thoroughly with a large quantity of antiseptic solution at blood-heat. The author notes the occurrence of strangles abscesses beside the rectum in a patient in which the disease assumed the suppressed form. It was necessary to lance the abscesses through the rectum.

DIETETICS.

ALLEN, R. S. "Citrus Fruit Rinds as a Hog Feed." *Bull. No. 227. Maryland State Coll. Agric. Exp. Station.* March 1919. Pp. 193-202.

"The results of these tests show that cooked citrus rinds are not poisonous to hogs, and that they have very little feeding value."

CROWTHER, C. "Fish Meal as a Food for Live Stock." *Journ. Board Agric.* Vol. XXVI., No. 5. August 1919. Pp. 480-484. To be issued as *Board of Agriculture and Fisheries Leaflet No. 333.*

DECHAMBRE. "The Rational Feeding of Dogs" (*Alimentation du chien par la méthode des facteurs du rationnement*). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Med. Vét.* 19th June 1919. Pp. 220-222.

M'CARRISON, R. "The Influence of Deficiency of Accessory Food Factors on the Intestine." *Brit. Med. Journ.* No. 3054. 12th July 1919. Pp. 36-39. "Pathogenesis of Deficiency Disease." *Indian Journ. Med. Res.* Vol. VI., No. 3. July 1919. Pp. 275-355.

The pathological changes in the intestine which result from a dietary deficient in accessory food factors have been studied in 152 pigeons fed

exclusively on autoclaved milled rice. "Deprivation of accessory food factors leads in pigeons to congestive and atrophic changes in all coats of the bowel, to lesions of the neuro-muscular mechanism, to impairment of digestive and assimilative processes, and to failure of its protective resources against infection."

MORGAN, E. "Some Notes on the Feeding of Flesh to Farrowing Sows, and the Habits of Pigs." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 217-218.

Two sows killed and partially ate their young. The author of the notes believes that feeding on semi-cooked meat was the cause of the development of the cannibal craving.

RODRIGUEZ, T. "Watery Forage and the Production of Milk" (Los forrajes acuosos y la producción de leche) *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 6. June 1919. Pp. 303-312.

SCHUBEL, E. C. W. "Our Method of Garbage Disposal." *Amer. Journ. Vet. Med.* Vol. XIV., No. 9. September 1919. Pp. 433-446.

The method as employed in Lansing, Mich., U.S.A. "Garbage-fed hogs show a slightly greater shrinkage in long shipments than grain-fed. Garbage-fed hogs dress away very little more than grain-fed. With proper management the meat produced is equal, and cannot be distinguished from that of grain-fed hogs. Garbage-fed hogs are exposed to cholera constantly, so immunisation is indispensable. Cholera in garbage-fed hogs may be associated with secondary infections, but can be controlled by immunisation. Garbage-fed hogs are not peculiarly susceptible to trichinosis and tuberculosis."

WOLL, F. W., and VOORHIES. "The Influence of Barley on the Milk Secretion of Cows." *Bull. No. 365*. College of Agric. Exp. Station, Univ. California. February 1919. Pp. 325-334. 4 Tables.

GENERAL.

CHAMBERS, F. "The Pony of the Northern District of Russia." *Vet. Record.* Vol. XXXII., No. 1627. 13th September 1919. Pp. 114-115.

"The pony of the Northern Region is a small, sturdy, and compact animal, averaging from 11 to 14 hands high, and weighing 700 pounds . . . an extremely hardy animal, capable of doing a large amount of work, standing extreme cold, subsisting on hay of an extremely poor nature, and, moreover, keeping his condition in spite of these many adverse circumstances. . . . Acute laminitis appears to be common. This is due to

overdriving. . . . Chronic laminitis is caused by chronic "hvorst" (*Equisetum palustre*) poisoning. . . . Glanders has never been known in the Archangel district, nor was mange met with until after the Revolution, when disbanded soldiers brought infected army animals back with them to their villages, and so spread the infection. . . . Pneumouia is practically never seen, and colic is rare."

FORD, T. A. "Notes on Veterinary Practice in the West Indies and the Malay States." *Vet. Journ.* Vol. LXXV., No. 8. August 1919. Pp. 45-54.

"About the only serious disease, or at least the only one that caused any great loss, I ever met with is called locally 'skin disease' in cattle; it occurs in cattle of all ages, is a form of eczema, and due to a combined attack of internal and external parasites."

MOUSSU, G. "The Number of Cattle, Sheep, and Pigs in France and her Colonies at the End of the War" (Le cheptel français et colonial à la fin la guerre 1914-1918). *Rec. Méd. Vet.* Vol. XCV., No. 11. 15th June 1919. Pp. 328-340.

At the beginning of 1914 there were 14,808,310 head of cattle in France. At the end of the year 1917 the number had diminished to 12,240,980; and at the end of 1918, in spite of all efforts to increase the number, the figure ranged between 12,000,000, and 12,500,000. The sheep population of France has been decreasing for a long time. There were 33,000,000 sheep in 1852, 18,500,000 in 1902, and 14,000,000 in 1914. On 1st January 1918 the number of sheep was not more than about 9,500,000. At the beginning of 1914 there were 7,000,000 pigs in France. In January 1918 the number had fallen to 4,000,000, and it is still lower to-day.

GENETICS AND HEREDITY.

FRATEUR, J. L. "The Nature of Telegony" (La nature de la télégonie). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 23. 19th July 1919. Pp. 883-884. (De la nature de la télégonie). *Ann. Méd. Vet.*, Brussels. Vol. LXIV., No. 2. February 1919. Pp. 33-49.

GIOVANOLI, G. "Four-horned Goats" (Vielhörigkeit bei der Ziege). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 7-8. July-August 1919. Pp. 271-275. 2 Figures.

HYGIENE AND PREVENTIVE MEDICINE.

ALLEN, J. A. "Preliminary Study in the Bacteriology of Jellied Meat Products." *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 394-397.

"Contaminated jellied tongue was probably the cause of an outbreak of meat-poisoning in Toronto in 1917. The containers in which the product is sold are not sterilised before use, the gelatine is frequently contaminated at time of packing, and the product is not sufficiently protected to prevent subsequent contamination. These are all factors in wastage due to decomposition. *B. botulinus*, *B. enteritidis*, or the hog-cholera bacillus have not been demonstrated in gelatine or spoiled jellied products; the chief organisms present are *B. proteus vulgaris*, *B. subtilis*, *B. mesentericus*, and *B. coli*. The sterilisation of gelatine does not affect its solidifying properties, provided it is of good quality. Jellied meat products may be sterilised in the final containers, and kept without deterioration for at least sixty days. Jellied meats put up by the ordinary commercial method show signs of decomposition in ten days when kept under usual conditions."

FREEAR, K., BUCKLEY, W., and WILLIAMS, R. STENHOUSE. "A Study of Two Types of Commercial Milk." Cambridge: Printed at the University Press, 1919. Pp. 32. 6 Charts, 9 Tables.

KUFFERATH, H. "The Bacteriological and Hygienic Control of Milk" (Le contrôle bactériologique et hygiénique des laits. Méthodes employées et appréciation des résultats). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 7. July 1919. Pp. 462-483.

LAUDER, A. "A Pure Milk Supply." *Scottish Journ. Agric.*, Edinburgh. Vol. II., No. 3. July 1919. Pp. 331-343. 3 Plates (6 Figures), 5 Tables.

TOCHER, J. F. "Variations in the Composition of Milk." *Scottish Journ. Agric.*, Edinburgh. Vol. II., No. 3. July 1919. Pp. 343-353. 5 Tables.

VIOLLE, H. "Peroxidases in Milk" (Sur les peroxydases dans les laits). *C. R. Acad. Sci., Paris.* Vol. CLXIX., No. 5. 4th August 1919. Pp. 248-250.

The reaction of peroxidases does not indicate the quality of milk; sound milk may contain very little, while milk from a diseased mammary gland may contain abundance of peroxidases. A positive reaction indicates that the milk is raw, but it is easy to produce the reaction in cooked milk by the addition of fresh organic fluids of diverse animal or vegetable origin of a varying composition.

INFECTIOUS DISEASES.

ALESSANDRINGI, G. "The Cure and Prophylaxis of Epizootic Lymphangitis with Tartar Emetic" (*Esperimenti di cura e profilassi nel farcino criptococcico (linfoспоридиоз) col tartaro emetico*). *Ann. d'Igiene*, Rome. Vol. XXVIII. 1918. Pp. 364-368.

For the cure and prophylaxis of cryptococcic farcy (epizootic lymphangitis) a solution consisting of antimony tartrate 3 grammes, sodium citrate 5 grammes, and distilled water 10 c.c. was found very efficacious. This preparation was injected intravenously into 105 horses afflicted with the disease. Complete cure was secured in 89·5 per cent. of the cases. (P. M. in *Abstr. Bacteriol.*)

BAKER, E. T. "Hemorrhagic Septicemia in Sheep." *Amer. Journ. Vet. Med.* Vol. XIV., No. 6. June 1919. Pp. 267-269 and 308. 1 Figure.

A review of the three forms of the disease, its causal organism, differential diagnosis, and treatment.

BROWNLEE, W. F. "Mixed Infections of Swine." *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 334-336.

BUCK, J. M., CREECH, G. T., and LADSON, H. H. "*Bacillus abortus*. Infection of Bulls." *Journ. Agric. Res.* Vol. XVII., No. 5. 15th August 1919. Pp. 239-246. 3 Plates (5 Figures).

CABRERA, M. "Rabies in the Domestic Animals" (*La rabia en los animales domesticos*). *Revista Soc. Med. Vet.*, Buenos Aires. Vol. IV., No. 3. March 1919. Pp. 67-71.

As showing the prevalence of rabies in the Argentine Republic in general, and in the Federal capital in particular, the following figures are given for the last two years. In 1917, 2079 living animals were received at the Pasteur Laboratory : of these, 140 were suffering from rabies. For 1918, the corresponding figures were 2661 and 190. In 1917, rabies was confirmed in 138 dead animals ; and in 1918, the disease was confirmed in 156 dead animals.

CANABY, E. "Anti-Variola Ovina Vaccination with Sensitised Virus" (*Vaccination anticlavéleuse par virus sensibilisé dans les Bouches-du-Rhône*). *Rec. Méd. Vét.* Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 243-248.

CARPENTER, C. M. "Controlling Calf Scours." *Cornell Veterinarian*. Vol. IX., No. 3. July 1919. Pp. 135-140.

"One of the vital points in this work is the feeding of milk to the calf. . . . Clean whole milk should be used for the food, especially during

the first two or three days of the calf's life, and then boiled milk should be used if the milk contains pathogenic organisms. Cleanliness should be observed, especially in case of containers for milk, the bedding, and pens, and it is highly important to keep the calves in separate pens with tight partitions. Animals that are scouring profusely should receive enemas of warm saline solution or $\frac{1}{4}$ per cent. Lugol's solution once or twice each day. Arthritis, pneumonia, and the other symptoms may be treated locally, but this has been very unsuccessful with us. The greatest work can be done with prophylactic methods, which are becoming each day a greater part of the veterinarian's work. In conclusion, I might repeat that the three most important factors in controlling infections of young calves are as follows: 1st, to have a clean uterus before conception; 2nd, to administer large amounts of serum as soon as the calf is dropped; 3rd, to feed the calf with small amounts of milk during the first few days of its life."

COMINOTTI, L. "Vaccination and Sero-Prophylaxis against Anthrax in the Province of Milan during 1918-1919" (Sulla vaccino e siero-profilassi svolta contro il carbonchio ematico nella provincia di Milano nell' anno 1918-1919). *La Clinica Vet.*, Milan. Vol. XLII., Nos. 15-16. 15th-31st August 1919. Pp. 499-503.

In general, sero-prophylaxis and vaccination against anthrax have given satisfactory results.

COTTON, W. E. "Abortion Disease of Cattle." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 504-528.

Contains a general consideration of the disease in the light of recent research. "By all means, if it is possible, use the agglutination or complement-fixation test to determine if infectious abortion exists in a herd. Both tests are reliable, but because of its simplicity the agglutination test is to be preferred. This test will show definitely whether the animal is or has been infected. It will not tell whether a cow will abort, because all infected cows do not abort. . . . Treatment of infected animals, up to the present time, has given very poor results. . . . Abortions are very plentiful one year, the next year treatment is given and the number is much smaller. The remedy is at once given the credit for the reduction, while if no treatment had been given the result would likely have been the same."

DAVIS, D. J. "The Effect of Potassium Iodid on Experimental Sporotrichosis." *Journ. Inf. Dis.* Vol. XXV., No. 2. August 1919. Pp. 124-131. 2 Figures, 2 Tables.

"Experimental sporotrichosis in rats responds promptly to potassium iodid. The lesions in the peritoneal cavity become firm, hard and small, and are surrounded by a dense fibrous capsule; within the nodules living sporotricha are found for a long time (at least four months). Potassium iodid will not prevent experimental sporotrichosis, but will cure it. It is

suggested that sporotrichosis, so readily produced experimentally, furnishes a good opportunity for the study of the behaviour and reactions of iodin and iodides in chronic infections."

DODD, S. "Enzootic Pneumonia of Calves." *Agric. Gazette, N.S.W.* Vol. XXX., No. 6. June 1919. Pp. 396-402.

"Dourine" (Il morbo coitale maligno). *La Clinica Vet.*, Milan. Vol. XLII., Nos. 13-14. 15th-31st July 1919. Pp. 427-434. *Ibid.*, Nos. 15-16. 15th-31st August 1919. Pp. 481-498. 7 Figures.

A general review of the disease.

EICHHORN, A. "The Control of some of the Important Infectious Diseases in the Conservation of our Live Stock." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 281-292.

A short consideration of anthrax, blackleg, haemorrhagic septicaemia, and swine fever.

GATES, W. L. "Anthrax and its Control." *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 339-341.

"The curative properties of the anti-anthrax serum treatment of infected animals is now an established fact. This serum has passed out of the experimental stage, and it is safe to use it in serious outbreaks and expect a reasonable percentage of the cases to recover if the serum is administered at the proper time and in sufficiently large doses."

JUNGERMAN, G. F. "Infectious Abortion." *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 327-328 and 342.

"My experience has been that the application of bacterin in such herds overcomes retention of placenta, metritis, scours, pneumonia, and umbilical infection in calves, and also diminishes to a minimum the loss of calves due to abortion. In addition, the bacterin treatment in dairy herds has been found to overcome the serious losses due to diminished flow of milk, and also it has practically eliminated mammitis in dairy herds. The treatment of herds without the use of bacterin has not been successful in my experience."

KINSLEY, A. T. "Differential Diagnosis of Swine Diseases." *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 421-422.

A brief review of swine fever, haemorrhagic septicaemia, mixed infection, etc.

LEIBOLD, A. A. "Report on Ulcerative Lymphangitis in the A. E. F." *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 387-391 and 419.

LIGNIÈRES, J. "The Eradication of 'Foot-and-Mouth' Disease" (La lucha contra la fiebre aftosa). *Revista Zootecnica*, Buenos Aires. Vol. VI., No. 68. May 1919. Pp. 541-548.

The Italian method, which consists in the injection of red blood corpuscles from a diseased animal, should be investigated in order to determine if it is capable of practical application in the Argentine Republic.

M'GILVRAY, C. D. "Relationship of Equine and Human Glanders." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 627-634.

NEWSOM, I. E. "The Results of Investigations of Hemorrhagic Septicemia in Sheep in Colorado." *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 371-375.

REMLINGER, P. "The Transmission of Rabies by apparently Healthy Dogs" (Comment un chien d'apparence saine peut transmettre la rage). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 15th May 1919. Pp. 175-181.

— "The Heredity of Rabies" (L'hérédité dans l'étiologie de la rage. Explication de certains cas de "rage spontanée" des jeune chiens). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 5th June 1919. Pp. 196-198.

RITZENTHALER. "The Diagnosis of Glanders" (Etudes clinique et diagnostiques de la morve). *Schweizer Arch. f. Tierheilk.* Zurich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 228-234.

Every unusual and obscure lesion on any part of the body ought to raise the suspicion of glanders. The application of diagnostic methods should not be delayed until there are striking external symptoms. The ophthalmic test is the method of choice, and should be applied periodically. Subcutaneous malleination should be used to confirm the ophthalmic test whenever diagnosis cannot be established by agglutination. Agglutination discloses glanders with certainty.

SARAZA Y MURCIA, J. "Filterable Viruses in Different Infections, and Particularly in Pasteurellosis" (Los virus filtrables en diversas infecciones y especialmente en las pasterelosis). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 8. August 1919. Pp. 486-500.

SCOTT, J. W. "Swamp Fever in Wyoming." *Bull. No. 121. Univer. Wyoming Agric. Exp. Station.* June 1919. Pp. 91-140. 6 Figures, 29 Charts.

SEEBERGER, X. "Examination of Swine Fever Material" (Über bakteriologische Untersuchungen auf Schweine-Rotlauf). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. XLI, Nos. 7-8. July-August 1919. Pp. 264-271.

An account of the bacteriological examination of material at the Veterinary Pathological Institute of the University of Zürich from the beginning of September 1913 to the end of August 1918.

SQUADRINI, G. "The Alteration in the Skeletal Muscles in 'Foot-and-Mouth Disease'" (Alterazioni muscolari nell' afta epizootica). *La Clinica Vet.*, Milan. Vol. XLII., No. 12. 30th June 1919. Pp. 369-370.

This is a preliminary note, in which the author claims to have observed changes in the skeletal muscles resembling those in the myocardium.

STOCKMAN, S. "The Pathology and Epizootiology of Louping-Ill (Disease of Sheep), with Special Reference to Chromatin Bodies in the White Corpuscles." *Trans. Soc. Trop. Med. and Hyg.* Vol. XII., No. 4. February 1919. Pp. 74-80.

Already noted from another source (*Review*, 1919, III. 32).

— "Vibrionic Abortion." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 499-504.

STONE, R. V., and FISHER, C. W. "A Chronic Pox-like Affection in Goats and its Successful Treatment." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 536-543.

TOPLEY, W. W. C. "The Spread of Bacterial Infection." *Lancet*. Vol. CXCVII., No. 5001. 5th July 1919. Pp. 1-5. *Ibid.* No. 5002. 12th July 1919. Pp. 45-49. *Ibid.* No. 5003. 19th July 1919. Pp. 91-96. 7 Charts, 1 Diagram.

This is a report of the Goulstonian Lectures delivered before the Royal College of Physicians of London.

The lecturer pointed out the need for knowledge regarding the causative organisms of the more important infective diseases, and a systematic survey of the bacterial flora of representative samples of the population. The normal bacteriology of important localities of the body is not known. Modern serological methods afford a means for the more exact differentiation of bacterial types that should prove of the greatest service in any such enquiry. The factors that tend to render the host-species more susceptible to attack, and especially the effect of such relatively simple matters as differences in temperature, atmospheric moisture, etc., are still very imperfectly understood. The success of prophylactic inoculation in pre-

venting the spread of epidemic infection has been amply demonstrated in certain diseases. Experience would suggest that it is in the prevention rather than in the treatment of disease that bacterial vaccines will find their permanent place.

“Ulcerative Lymphangitis” (*Contribution à l'étude de la lymphangite ulcéruse*). *Rev. Gén. Méd. Vét.* Vol. XXVIII., No. 329. May 1919. Pp. 233-243.

VAN SACEGHEM, R. “Ulcerative Lymphangitis” (*La lymphangite ulcéruse*). *L'Écho Vét.*, Liège. Vol. XLVIII., No. 3. July 1919. Pp. 75-80.

A *résumé* of recent literature.

— “Ulcerative Lymphangitis” (*Recherches et expériences sur la lymphangite ulcéruse des équidés*). *Ann. Med. Vét.*, Brussels. Vol. LXIV., Nos. 3-4. March-April 1919. Pp. 80-83. (*Traitemennt de la lymphangite ulcéruse*.) *Ibid.* Pp. 83-86.

The substance of these papers has been abstracted already from another source (see this *Review*, 1919, III. 38 and 280).

WATTERS, G. L. “Diagnosis and Treatment of Necrobacillosis in Swine.” *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 336-337.

MEDICINE.

AUGSBURGER, E. “The Blood in Chronic Pulmonary Emphysema in the Horse” (*Blutbefunde beim Lungendampf des Pferdes*). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 199-228.

BAILEY, W. H. “Passive Hyperthermia.” *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 331-333.

“Nothing new is offered; simply an effort has been made to review more or less well-known facts as concisely as possible.”

BAKER, E. T. “Sheep Practice.” *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 400-404.

BRUCE, E. A. “Stercoremia of Sheep.” *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 553-558.

This paper refers to the loss of a number of sheep from what the author concluded was stercoræmia, “a toxic state occasioned by poisons absorbed

from retained faeces." The sheep had eaten a considerable quantity of cactus (*Opuntia*, sp.). "The animals appear dull, hang their heads and let the ears droop, are off their feed and constipated, froth a little at the mouth, but frothing does not last over one day; there is a nervous movement of the head and ears, and the head may be carried high or to one side; there is apparent blindness, an unsteady gait, and grinding of the teeth. The degree of sickness varies; some may keep on their feet, but the bad cases go to the ground in from one to four days; the fattest ewes go down the quickest. . . . If given early enough, a dose of salts or oil and enemas are of benefit, but experience shows that badly affected animals suffer acutely if drenched, and usually die. . . . While there may be other closely allied conditions in sheep, it seems reasonable to suppose that at least some of the cases which have been diagnosed heretofore as preparturient eclampsia and prepartum paralysis are in reality cases of stercoremia."

CAMPBELL, A. W., and CLELAND, J. B. "Cage Paralysis in Monkeys." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 2. June 1919. Pp. 95-104. 3 Figures.

CROCKER, W. J. "Blindness in Calves Due to Insidious Rachitis." *Cornell Veterinarian*. Vol. IX., No. 3. July 1919. Pp. 171-174. 2 Figures.

DI DOMIZIO, G. "Cerebro-Spinal Meningitis in Mules" (Una enzoozia di malattia di Borna nei muli. Contributo alla conoscenza della malattia di Borna). *La Clinica Vet.*, Milan. Vol. XLII., Nos. 15-16. 15th-31st August 1919. Pp. 445-480. 4 Figures.

DODD, S. "Notes on Infestation of the Skin, etc., of Sheep by Grass Seeds." *Agric. Gazette, N.S.W.* Vol. XXX., No. 4. April 1919. Pp. 255-259.

— "Infestation of the Skin, etc., of Sheep by Grass Seeds." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 2. June 1919. Pp. 90-95.

DRAGSTEDT, L. R., DRAGSTEDT, C. A., M'CLINTOCK, J. T., and CHASE, C. S. "Intestinal Obstruction. II. A Study of the Factors Involved in the Production and Absorption of Toxic Materials from the Intestine." *Journ. Exp. Med.*, Baltimore. Vol. XXX., No. 2. August 1919. Pp. 109-121.

From observations made on dogs. "It is impossible to sterilize the intestine by the use of chemical antiseptics even when these are applied directly to the mucosa of isolated segments. The mucosa of the alimentary tract does not elaborate an internal secretion which is necessary to life, or a secretion which could be disturbed by the conditions of acute obstruction so as to account for the symptoms complex of that condition. The substances responsible for the toxæmia in acute obstruction are produced by the

action of intestinal bacteria on proteins or their split products. An injury to the intestinal mucosa, particularly that resulting from disturbances of the blood supply to the intestine, greatly facilitates the absorption of these poisons."

FLUCK, H. "An Apparatus for the Treatment of Tympanites" (Ein neuer Apparat (Ructator) zur Behandlung typanitischer Tiere). *Schweizer Arch. f. Tierheilk.*, Zurich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 240-241. 1 Figure.

Describes an apparatus, here called a "ructator," to fix in the mouth of a tympanitic animal in order to stimulate the glossopharyngeal nerve.

GREGORES, A. E. "Contribution to the Study of a New Disease of Epizootic Character Affecting Equines in the Argentine Republic" (Contribución al estudio de una nueva enfermedad de carácter epizoótico de los equinos). *Revista Soc. Med. Vet.*, Buenos Aires. Vol. IV., No. 5. May 1919. Pp. 139-144.

HARRIS, W. H., and CHILLINGWORTH, F. P. "The Experimental Production in Dogs of Emphysema with Associated Asthmatic Syndrome by Means of an Intra-Tracheal Ball Valve." *Journ. Expt. Med.* Vol. XXX., No. 1. July 1919. Pp. 75-85. 3 Plates (7 Figures).

"Experimental emphysema can be produced in dogs by impeding expiration by means of a properly constructed ball valve introduced into the trachea. This method affords a practical means of study of various physiological, pathological, and clinical aspects of emphysema. The experiments demonstrate that any lesion or factor capable of interfering sufficiently with proper air expulsion yet permitting of sufficient air intake will occasion emphysema. Attacks simulating those of asthma are occasioned in experimental emphysematous animals after exercise as well as during and following inhalation of mildly irritant gases."

KRUPSKI, A. "Impotentia Coeundi in a Bull as the Result of Inflammation of the Right Seminal Vesicle" (Impotentia coeundi bei einem Zuchttier infolge hochgradiger Entzündung der rechten Samenblase). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 7-8. July-August 1919. Pp. 259-264. 2 Figures.

Inability to perform the sexual act on the part of a bull was apparently due to marked inflammation, with enlargement and sensitiveness, of the seminal vesicle. The diseased vesicle was 17 cm. long by 7 cm. broad, while the healthy vesicle measured 11 cm. by 4 cm. Bacteriological examination of the exudate that could be expressed from the vesicle revealed numerous Gram-positive cocci, but no tubercle bacilli. The author thinks that the lesion in the seminal vesicle was doubtless due to an ascending inflammation. The testes were perfectly normal.

LAKE, B. L. "Dysentery in Adult Cattle." *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 329-330.

LIENAUX, E. "Some Observations on Cases of Sudden Death" (A propos de quelques observations de mort subite). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., No. 1. January 1919. Pp. 1-6. *Ibid.* No. 2. February 1919. Pp. 49-52.

A consideration of sudden death in cases of purulent collection in the guttural pouch (diverticulum of the auditory tube) in a horse, an abscess of the throat and neck of a pig, nasal fistula in a dog, lesions of the heart and pericardium, and pleurisy with effusion.

M'GOWAN, J. P. "Cholera of the Sheep" (Jaundice; yellows or yellow-ses; headgrit or plocach). *Lancet.* Vol. CXCVII., No. 5010. 6th September 1919. Pp. 426-429.

MENNERAT. "An Anti-Gas Mask for Horses" (Masque anti-asphyxiant pour chevaux). *Rec. Méd. Vét.* Vol. XCV., No. 13. 15th July 1919. Pp. 393-394 1 Figure.

MOUSSU, R. "'Railway Fever' in Bovines" (La maladie des chemins de fer des animaux de l'espèce bovine). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 19th June 1919. Pp. 216-219.

PLANTUREUX. "The Action of Asphyxiating 'Gas' on Equines" (Contribution à l'étude de l'action des gaz asphyxiants sur les équidés). *Rec. Vét. Méd.* Vol. XCV., No. 13. 15 July 1919. Pp. 377-381.

QUENTIN. "The Effects of Asphyxiating 'Gas' on the Horse" (Quelques notes sur les effets des gaz asphyxiants chez le cheval). *Rec. Méd. Vét.* Vol. XCV., No. 13. 15th July 1919. Pp. 381-393.

QUEVEDO, J. M. "On the Nature of a Recent Epizootic Disease of Equines in the Argentine Republic" (Sobre la naturaleza de la última epizootia de los equinos). *Revista Soc. Med. Vet.*, Buenos Aires. Vol. IV., No. 5. May 1919. Pp. 149-157.

RASMUSSEN, J. C. "Purpura Hemorrhagica following Influenza." *Amer. Journ. Méd. Vét.* Vol. XIV., No. 6. June 1919. Pp. 281-283.

"Wounds, ulcers, and abscesses require antiseptic surgical treatment. The nasal cavities should be carefully syringed out two or three times a day with a non-irritating antiseptic or disinfecting solution, such as a 2 to 4 per cent. solution of boric acid, creolin, or lysol. Gangrene of the swellings of the skin in many cases may be retarded by rubbing with spirits of turpentine two or three times daily. . . . Very little benefit seems to be derived

from local treatment of the cutaneous swellings with astringents. Favourable results may be secured by the use of pure oil or ointments to lessen the tension of the swellings. . . . Conjunctivitis may be controlled by a 5 per cent. solution of boric acid or by blowing sodium borate into the eye. . . . Of late years, calomel, linseed oil, and potassium iodide, and the polyvalent bacterins have given me the most favourable results."

REAKES, C. J., and ASTON, B. C. "Curative Treatment of Bush Sickness by Iron Salts." *N.Z. Journ. Agric.* Vol. XVIII., No. 4. April 1919. Pp. 193-197. 2 Figures.

"Summarizing the results of the medical experiments to date, it would appear that of the inorganic preparations while either the administration of (*a*) phosphates or (*b*) iron compounds to cattle on phosphate-dressed pasture may enable them to be kept healthy for a much longer period than would otherwise be possible, it is only by drenching with a syrup-of-iron phosphate that animals may be kept healthy indefinitely or cured of bush sickness. Of organic compounds it is certain that the double citrate of iron and ammonium is a quicker cure for bush sickness than the syrup-of-iron phosphate. It is probable that other organic salts of iron would be similarly successful."

ROSSIGNOL, L. "Paraplegia Caused by Over-Feeding with Molasses" (Paraplégie par suralimentation molassée). *Bull. Soc. Méd. Vét. Pratique.* Vol. III., No. 6. June 1919. Pp. 157-158.

SCHNEIDER, R. "Pseudo-Glanders" (Einige Bemerkungen über "Pseudorottz"). *Schweizer Arch. f. Tierheilk.* Zurich. Vol. LXI., Nos. 5-6. May-June 1919. Pp. 235-237.

SENSEMAN, B. F. "Horse Typhus; *Morbus maculosus*" (Purpura haemorrhagica). *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 385-390.

The author writes enthusiastically of the good results of turning the patients out to pasture. "Where I have been favoured with a pasture, I am confident that the death-rate has not been 10 per cent. The last five cases I have been called upon to treat happened during the summer, and as soon as diagnosis was made the animals were turned into the pasture, and all made quick and good recoveries."

STALDER, H. "Subcutaneous Injection of Salicylate of Sodium in Infectious Articular Rheumatism in Pigs" (Le salicylate de soude en injections sous-cutanées dans le traitement du rhumatisme articulaire infectieux du porc). *Schweizer Arch. f. Tierheilk.* Zürich. Vol. LXI., Nos. 7-8. July-August 1919. Pp. 302-303.

Inspired by the suggestion made by Lhoste (*Rev. Path. Comp.*, 1918, XVIII. 265-267; this *Review*, 1919, III. 240) that salicylate of sodium should

be given subcutaneously in cases of rheumatism, Stalder has tried this method in pigs. One or two grammes in 20 c.c. of water effected a cure after the second dose.

METHODS.

BONNEL and CATTAERT. "Note on the Use of Tournesol of Orcuin in Bacteriology" (Note sur l'emploi du tournesol d'orcine en bactériologie). *Rev. Path. Comp.*, Paris. Vol. XIX., No. 157. June 1919. Pp. 19 (175)-20 (176).

Tournesol of orcein may replace with advantage the tincture of tournesol generally employed in culture media as an indicator of sugar fermentations. It gives extremely sensitive reactions of a superb colour. It may be incorporated in bouillon or agar and sterilised without risk of alteration. A method by which it may be used is given.

ECKER, E. E., and SASANO, K. "A Rapid Method for Preparing Antigens from Normal Heart Muscle." *Journ. Inf. Dis.* Vol. XXV., No. 2. August 1919. Pp. 174-177. 1 Table.

"Suitable antigens can be made by extracting normal heart tissues for a period from one to three hours with boiling alcohol in a reflux condenser. The value of these antigens compares favourably with those extracted by the usual methods. A primary extraction of the dried tissues with ether results in a slight loss of their fixing power, but yields extracts containing less anti-complementary substances."

KUFFERATH, H. "The Estimation of Leucocytes in Milk" (A propos de la recherche des leucocytes dans le lait). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 6. June 1919. Pp. 420-424. 1 Figure.

MARINO, F. "The Culture of the Tetanus Bacillus in the Presence of Tuberculin" (De la culture du bacille du tétonos en présence de la tuberculine). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 6. June 1919. Pp. 349-352. (De la culture du bacille tétanique en présence de la tuberculine. Procédé de dosage de la tuberculine.) *C. R. Soc. Biol.* Vol. LXXXII., No. 22. 12th July 1919. Pp. 821-823. (De la culture du bacille tétanique en présence de la tuberculine. Détermination du pouvoir antitoxique des sérum anti-tuberculeux.) *Ibid.* Pp. 823-824. (De la culture du B. tétanique en présence de la tuberculine.) *Ibid.* Pp. 831-832.

SAVAGE, A. "Pump Attachment for Record Syringes." *Vet. Journ.* Vol. LXV., No. 8. August 1919. Pp. 58-59. 1 Figure.

This consists of a Y-shaped tube, the two arms of which are fitted with non-return valves set in opposite directions.

OBSTETRICS.

DECHAMBRE. "Superfecundation in a Mare" (Un cas de superfécondation chez la jument). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 19th June 1919. P. 216.

A mare was served by a horse on the 8th May 1918 and by an ass on the 10th of the same month. On the 14th April 1919 she gave birth to a mule, and, two or three hours later, to a foal.

DEVINE, J. F. "Puerperal Eclampsia in the Cow." *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 411-414.

"As to the cause nothing definite is known. The theory that eclampsia is due to an intoxication, is a toxæmia, is most generally accepted. . . . Narcotics to relieve the convulsions, diuretics, diaphoretics, and cathartics are indicated to prevent recurrence. After the acute symptoms have passed, frequent small doses of sodium chloride (well sweetened with molasses or syrup), to induce copious drinking, is a valuable treatment to guard against recurrent attacks."

HALLMAN, E. T. "Abortion and Sterility." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 3. June 1919. Pp. 297-302.

HAMOIR, J. "Vaginal Fibrous Bands and Partial Membranous Occlusion of the Uterine Os in the Cow" (Sur les brides vaginales et les cloisons du col utérin chez la vache). *L'Echo Vét.*, Liège. Vol. XLVIII., No. 3. July 1919. Pp. 88-91.

LACROIX, J. V. "Prolapsus of the Vagina." *Amer. Journ. Vet. Med.* Vol. XIV., No. 8. August 1919. Pp. 392-394.

PRICE, B. "Observations and Results Obtained in Treating Cattle for Sterility." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 390-394.

"The chief cause or causes is the increasing prevalence of granular vaginitis and abortion, a disease to which a very large percentage of the existing sterility is due. I am satisfied that about 75 per cent. of the sterility in cows is due either directly or indirectly to the bacillus of abortion. . . . In my practice during the past season there have been fewer cases of sterility than in previous years. This I attribute to the fact that all cows which abort and which retain the afterbirth or have any pyometra are given the (Albrechtsen) treatment, and by following this method I am convinced that sterility among cows can be reduced 75 per cent., and the cows can be bred in from one to three months earlier than those not treated."

PARASITOLOGY
(Including Entomology and Protozoology).

ACKERT, J. E. "On the Life Cycle of the Fowl Cestode, *Davainea cesticillus* Molin." *Journ. Parasitol.* Vol. V., No. 1. September 1918. Pp. 41-43. 1 Plate.

Experimental work now reported seems to show that the house fly may transmit *Davainea cesticillus* to chickens.

ACKERT, J. E., and GRANT, A. A. "The Domestic Cat a Host of the Dog Tapeworm, *Taenia pisiformis*." *Trans. Kansas Acad. Sci.* Vol. XXVIII. 1916-17. Pp. 257-259.

"The authors found that *T. pisiformis* may develop in the young cat, and that evagination of *Cysticercus pisiformis* occurs in the duodenum of the domestic kitten." [Exp. Station Record.]

BERTRAND, G., and DASSONVILLE. "Treatment of Mange of Equines by the Vapour of Chloropicrin" (Sur le traitement de la gale des équidés par les vapeurs de chloropicrine). *C. R. Acad. Sci.* Vol. CLXIX., No. 10. 8th September 1919. Pp. 486-489.

BEVAN, LL. E. W. "Inoculation of Cattle against Redwater and Gall-Sickness." *Rhodesia Agric. Journ.* Vol. XVI., No. 2. April 1919. Pp. 99-106. 2 Charts.

"A great deal of distrust and misconception exists concerning the results of inoculation of imported stock, it being asserted that the operation interferes with the growth, fertility, and usefulness of the animals. Much of this is not supported by fact, and after careful enquiry it has been found that, where inoculated animals have failed to give satisfaction, the fault has often been due to the carelessness and incompetence of the owner, against which no method of inoculation has yet been devised."

BRUCE, E. A. "A Preliminary Note on a New Coccidium of Rabbits." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 620-621.

"This coccidium of the genus *Eimeria*, which is especially pathogenic for young rabbits, differs from previously described forms: In the extreme variation of the size of the oocysts, the pinkish-orange colour of its larger oocysts, the excessive formation of material for the oocyst wall, the pink colour of its sporozoite nucleus, and the presence of a very well-marked globular residual body. A series of drawings covering the exogenous forms is now ready, but publication of the same is being deferred pending a completion of a study of the whole life cycle."

BRUMPT, E., and CAUCURTE. "Prevention of Strongylosis in Ruminants" (Essais de traitements préventifs des strongyloses des ruminants). *Bull. Soc. Méd. Vét. Pratique*, Paris. Vol. III., No. 6. June 1919. Pp. 168-174.

CAMERON, A. E. "The Oviposition Habit of *Gastrophilus nasalis*." *Science*. Vol. XLIX., No. 1253. 1919. P. 26.

Gastrophilus nasalis has not been observed to oviposit on the lips of the horse: the eggs are almost invariably deposited on the hairs of the throat. The eggs are not adapted for the penetration of the skin.

CAZALBOU, L. "The Effect of the Surrounding Temperature on the Condition of Mange Patients Clipped and Dressed with Ointments" (Variations de l'état d'entretien, en fonction de la chaleur du milieu extérieur, sur des chevaux galeux tondus et pommadés). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 5th June 1919. Pp. 192-195. 5 Tables.

CHATTON, E. "The Pure Culture of a *Leptomonas* of the Dog Flea" (Sur la culture pure d'un *Leptomonas* de la puce du chien et sur un caractère de ses formes culturales qui les distinguent de celles du kala-azar de souches humaine et canine). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 313-315.

COMINOTTI, L., and DI DOMIZIO, G. "The Piroplasma of the Prealpine Regions" (Intorno al piroplasma delle regioni prealpine). *La Clinica Vét.*, Milan. Vol. XLII., No. 12. 30th June 1919. Pp. 363-369. 1 Plate (5 Figures).

The authors return to the morphology and classification of the piroplasma that causes haemoglobinuria in the prealpine regions of Italy. They aver that the organism is clearly differentiated from *Piroplasma bigeminum* by its notably smaller size, the presence of pear-shaped forms in couples (or occasionally in fours), the prevalence of irregularly rounded forms, the size of the granules, and the tendency of the parasite to assume a marginal position. They are of opinion that its morphology accords perfectly with that described by Kossel and Weber for *Piroplasma finlandese*.

CRAIG, J. F. "Intestinal Coccidiosis of Cattle." *Vet. Record*. Vol. XXXII., No. 1618. 12th July 1919. Pp. 11-12. 1 Plate (3 Figures).

Reports the occurrence of intestinal coccidiosis in cattle in Co. Leitrim. "In acute cases death occurred in about nine days, exceptionally in a fortnight. The cases which recovered ceased to pass blood in about five or six days, but their condition remained poor for a time, and the faeces were stinking and yellowish in colour. If they did not cease to pass blood in about five or six days they usually died. Before death they were emaci-

ated, unable to rise, their eyes became sunken, their muzzle cold and clammy, the temperature subnormal, and death occurred in convulsions. . . . This history suggests that intestinal coccidiosis is not rare in one district in Ireland, but the extent and prevalence of the disease can only be ascertained after an extensive examination of the faeces of cattle in suspicious cases, and this note is intended to stimulate further enquiry."

CROCKER, W. J. "Anoplocephala in the Cæcum of the Horse." *Cornell Veterinarian.* Vol. IX., No. 3. July 1919. Pp. 176-177. 3 Figures.

In the laboratory of Veterinary Pathology and Bacteriology, University of Pennsylvania, *Anoplocephala magnum* has been observed in the cæcum of the horse in ten different cases within the past nine years. *Anoplocephala mamillata* has not been observed. Four cases of cæcal infestation of the horse with *Anoplocephala perfoliata* have been noted between 1910 and 1919. The author of the note believes that this is "the first time *A. perfoliata* of the cæcum of the horse in America has been correctly reported."

[On the occurrence of *Anoplocephala* spp. of the horse in the United States, see also Hall and Hoskins, *Cornell Veterinarian*, 1918, VIII. 287-292, and Hoskins, *Ibid.*, 1919, IX., 110-111 (this Review, 1919, III., 376).]

CROVERI and SALVESTRONI. "Demodectic Mange in the Horse" (*Rogn demodettica nel cavallo*). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 7. July 1919. Pp. 388-390. 1 Figure.

DALRYMPLE, W. H. "Note on the Occurrence of *Filaria papillosa*." *Journ. Amer. Vet. Med. Assoc.* Vol. LIV., No. 6. February 1919. Pp. 643-647.

A record of the occurrence of *Filaria papillosa* in the aqueous humour of the eye of a horse in the United States of America. According to the owner of the animal, the parasite was about $\frac{1}{6}$ of an inch in length when first observed about nine days before its extraction. When extracted, the worm was 50 mm. in length, apparently fully developed, and probably a male.

FROGGATT, W. W., and FROGGATT, J. L. "Sheep-Maggot Flies, No. 4." *Farmers' Bull.* No. 122. Dept. Agric. N.S.W., Sydney. December 1918. Pp. 24. 4 Figures.

The following mixtures have given good results in the treatment of sheep that have been blown:—1 pint of spirits of tar and 5 pints of kerosene; $1\frac{1}{2}$ pounds of sodium arsenite dissolved in 50 or more gallons of water; 1 pint of turpentine and 5 pints of castor oil; and sulphate of copper solution. The last-named hardens and stains the skin, and is therefore not to be recommended. Dipping and spraying are doubtful remedies, and in any case the results last for a short time only.

GALLI-VALERIO, B. "Notes on Parasitology and Parasitological Technique" (Notes de parasitologie et technique parasitologique). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI., Nos. 7-8. July-August 1919. Pp. 289-302. 9 Figures.

A number of short notes on the geographical distribution of some parasites, observations on some phyto-parasites, observations on zoo-parasites, and notes on parasitological technique.

GUBERLET, J. E. "On the Life History of the Lungworm, *Dictyocaulus filaria*, in Sheep." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 621-627.

HILL, G. F. "Relationship of Insects to Parasitic Diseases of Stock." *Proc. Roy. Soc. Victoria*, Melbourne. Vol. XXXI., No. 1. December 1918. Pp. 11-107. 7 Plates.

HORNBY, H. E. "A Few Notes on Auto-Agglutination." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 207-211.

——— "The Diagnosis of African Equine Trypanosomiasis." *Vet. Journ.* Vol. LXXV., No. 6. June 1919. Pp. 218-225.

LAVERAN, A., and FRANCHINI, G. "Herpetomonas ctenocephali of the Dog Flea and its Culture" (Au sujet de l'Herpetomonas ctenocephali de la puce du chien et de sa culture). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 310-313. 2 Figures.

LIGNIÈRES, J. "On a New Parasite of 'Tristeza'" (A propósito de un nuevo parásito de la "tristeza"). *Revista Zootecnica*, Buenos Aires. Vol. VI., No. 69. June 1919. Pp. 649-653. *Revista Soc. Med. Vet.*, Buenos Aires. Vol. IV., No. 5. May 1919. Pp. 144-149.

This is a criticism of Quevedo's paper (*Revista Soc. Med. Vet.*, 1918, iii. 504-509; this *Review*, 1919, III. 379), in which the name *Babesia minor* was proposed for a piroplasm causing "tristeza." Lignières says that, until the contrary is fully demonstrated, he will regard the parasite described by Quevedo as a piroplasm of the *argentinum* type.

——— "The Control of 'tristeza.' A 'tristeza' Vaccination Station and Acclimatisation Camps" (La lucha contra la "tristeza" y la riqueza ganadera de la República Argentina. La "estación de vacunación contra la tristeza" y los "campos de aclimatación"). *Revista Zootecnica*, Buenos Aires. Vol. VI., No. 69. June 1919. Pp. 605-616.

M'DONALD, A. H. E. "The Prevention of Blow-Fly Attacks on Sheep by Spraying." *Agric. Gazette, N.S.W.* Vol. XXX., No. 6. June 1919. Pp. 403-405. 3 Figures.

"A spraying race has been provided for the work, and the spraying is done by means of a powerful hand-pump. Indeed, though referred to as 'spraying,' the operation really consists of forcing the liquid into the wool by means of a very strong jet. The specifics under test were an arsenical sheep-dip powder, a carbolic liquid dip, and a mixture the active agent in which was arsenite of soda. These specifics were mixed with water to make a solution strong enough to destroy maggots without injuring the sheep or the wool. . . . It was observed during last year that the treated sheep were not absolutely protected from attacks by the sprays; but while the affected sheep in the untreated group amounted to 54 per cent., in each of the treated groups the percentage of affected sheep was only 33 per cent., a fairly substantial reduction."

MAGUIRE, L. C. "Coccidiosis in Bovines." *Vet. Record.* Vol. XXXII., No. 1620. 26th July 1919. Pp. 35-36.

Commenting on the article by Craig (*vide supra*), Maguire says that he has several times encountered cases of bovine intestinal coccidiosis in Ireland. He has given "large doses of ipecacuanha, together with other astringents. The effect was most remarkable; after about the third dose the blood in the faeces disappeared; in about two days the diarrhoea had ceased, and all eight animals recovered. Since then I have had several more cases, and now I use Dover's powder, half ounce doses three or four times daily, according to the severity of the case. Since using this I have not, I think, lost a single animal suffering from the disease. . . . My experience will show that coccidiosis is widely spread over Ireland, and is also I believe quite common in England."

[Notes on recent papers by Sanlorenzo, Galli-Valerio, Cremona, Smith and Graybill, and Lentz have been given in this *Review*, 1918, II. 181, 390, 467; 1919, III. 116. The good results following the administration of thymol have been pointed out by Sanlorenzo and Cremona.]

MOUQUET. "The Terms 'Multilocular' and 'Multivesicular' as Applied to Echinococcosis" (Les mots "multiloculaire" et "multivésiculaire" qualificatifs de l'échinococcosé). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 15th May 1919. Pp. 174-175.

The term "multilocular" has been used by different writers to indicate:—
 A. Human alveolar echinococcosis. B. Human osseous echinococcosis (hydatid miliary echinococcosis of Dévé). C. Multilocular echinococcosis of animals. D. Ordinary echinococcosis with plurilocular cysts, and consequently multivesicular.

- NAVEZ, O. "Generalised Sarcosporidiosis in the Cow: a Contribution to the Study of Sarcosporidiosis" (Un cas de sarcosporidiose généralisée chez la vache et contribution à l'étude des sarcosporidioses). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., Nos. 5-6. May-June 1919. Pp. 159-175.
- PHIPPS, F. E. "Trypanosomiasis in the Neighbourhood of Carnot (Upper Sanaga, Cameroon)" (Les trypanosomiases dans la région de Carnot (Haute-Sangha)). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 7. July 1919. Pp. 416-434. 1 Map.

The article contains reference to trypanosomiasis of bovines observed in the neighbourhood of Carnot. In dry seasons the disease does not exist, but during the rains it decimates the herds. Two types of organism have been recognised: (1) A long, thin form with tapering posterior extremity and a long free flagellum. (2) A large and broader form with a thick posterior extremity and a free flagellum. The length of the two forms ranges from $22\text{ }\mu$ to $26\text{ }\mu$. From inoculation experiments, the author concludes that it is *T. cazaloui* that is the cause of infection of the bovines. The transmitting agent offers a difficulty, for *Glossina* has not been detected. *Stomoxys*, on the contrary, occurs in great numbers, and incessantly annoys the cattle.

- PILLERS, A. W. N. "On the Occurrence of *Aleurobius farinæ* (de Geer) in Skin Scrapings of Horses." *Vet. Record.* Vol. XXXII., No. 1619. 19th July 1919. Pp. 22-23. 1 Plate (7 Figures).

"The present short note deals simply with the microscopical diagnosis point of view of one (of the 'forage acari') found on the skin."

- RAILLIET, A., HENRY, A., and BAUCHE, J. "A New Strongylid of the Pig" (Un nouveau strongylidé du porc). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 324-332. 5 Figures.

- RAILLIET, A., and MOUQUET, A. "Coenurus of the Coypu" (Cénure du coypou). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 19th June 1919. Pp. 204-211. 2 Figures.

After comparison with other known species of *Coenurus* (*Multiceps*), the authors conclude that the parasite of the coypu (*Myopotamus* or *Myocaster coypus*) stands apart from the rest. Because of the club-like form of the scolex, they propose the name *Multiceps* or *Coenurus clavifer*.

- "Chorioptic Mange in the Mouflon" (Gale chorioptique du mouflon à manchettes). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 19th June 1919. Pp. 212-215. 1 Figure.

To the knowledge of the authors, *Chorioptes* has not been described as infesting the mouflon (*Ammotragus lervia* Pallas, or *Ovis tragelaphus* Desm.).

At first they thought that it differed from *Choriopites* of the horse, ox, and goat in the possession of a single foliaceous hair at the extremity of each abdominal lobe; but a comparison showed that all these forms have the same character. The parasite of the mouflon, therefore, does not differ from that of the domestic herbivores; but, as its size is a little larger, the authors propose a special variety for it, as indicated by the name *Choriopites bovis* var. *ammotragi*.

RANSOM, B. H. "Effects of Heat on Trichinæ." *Journ. Agric. Res.* Vol. XVII., No. 5. 15th August 1919. Pp. 201-221. 2 Tables.

RITCHIE, J. "Bot-Flies of the Horse." *Scottish Journ. Agric.*, Edinburgh. Vol. II., No. 3. July 1919. Pp. 354-358. 6 Figures.

This article deals with the species of bot-fly in Britain, their habits, their harmful effects, and the measures to be taken against them.

ROUBAUD, E. "The Anti-Malarial Rôle of Domestic Animals" (Antagonisme du bétail et de l'homme dans la nutrition sanguine de l'*Anopheles maculipennis*. Le rôle antipaludique du bétail domestique). *C. R. Acad. Sci.*, Paris. Vol. CLXIX., No. 10. 8th September 1919. Pp. 483-486.

It is concluded that, in France, domestic animals play an anti-malarial rôle of the first importance in attracting to themselves the majority of *Anopheles*. Far from exercising, as might be supposed, a prejudicial effect by contributing to the support of the *Anopheles* populations of a district, they avert and disturb those dangerous relations that, in the absence of domestic animals, would be compulsory between *Anopheles* and man.

— "The Nutrition and Symbiotic Life of the Tsetse-Flies" (Les particularités de la nutrition et la vie symbiotique chez les mouches tsétsés). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 8. August 1919. Pp. 489-536. 17 Figures.

ROYER, A. "Sarcoptic Mange of the Horse" (La gale sarcoptique du cheval). *L'Echo Vét.*, Liège. Vol. XLVIII., No. 3. July 1919.

A résumé of diagnosis and treatment.

SAUNDERS, C. G. "Coccidiosis in Rabbits." *Amer. Journ. Vet. Med.* Vol. XIV., No. 9. September 1919. Pp. 435-438.

SHEATHER, A. L. "A New Nematode Causing Parasitic Gastritis in Calves." *Bull. No. 86. Agric. Res. Inst. Pusa.* 1919. Pp. 5. 5 Plates (12 Figures).

SIMSON, W. A. "Helminthiases of Stomach and Intestines of Stock in South Africa." *Vet. Record.* Vol. XXXII., No. 1626. 6th September 1919. P. 104.

Out of nine horses, five died. Two of these had thousands of small worms in a layer of amber-tinged gelatinous mucus adherent to the mucous membrane of the stomach. The parasite may be a species of *Spiraptera*. Twelve cows, one heifer, and one young ox died. The post-mortem examination of one of the cows revealed a roughness of the mucous membrane of the pyloric end of the abomasum. "In scrapings of mucus from that part small parasites were easily demonstrated, mucosa of duodenum showed mucus slightly blood-tinged, in which also small parasites were easily demonstrated. . . . These parasites may be *Tricostrongylus extenuatus* and *Tricostrongylus instabilis*." Heavy infestations with *Strongylus contortus* have been found in post-mortems on sheep that had been sick for a few days only. "Similarly, on post-mortem of some Angora goats, carcases have been in good condition, and only *Tricostrongylus* infection and lesions have been observed in abomasum, duodenum, and jejunum."

TAYLOR, F. E. "Intravenous Injections of Antimonium Tartaratum (Tartar Emetic) in Bilharziasis." *Journ. Roy. Army Med. Corps*, London. Vol. XXXIII., No. 2. August 1919. Pp. 181-190.

"That tartar emetic when injected intravenously exerts a striking beneficial effect on vesical bilharziasis is amply demonstrated by the cases here recorded, but the manner in which this effect is produced is not so evident. That the drug kills or inhibits the activity of the parasite appears to be the most reasonable suggestion. At what stage in the life history of the parasite this occurs, whether ovum, miracidium, or adult worm, or all three, has not yet been demonstrated."

VAN DEN EECKHOUT, M. A. "The Treatment of Sarcoptic Mange in the Horse" (Du traitement de la gale sarcoptique chez le cheval). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., Nos. 3-4. March-April 1919. Pp. 112-115.

VAN SACHEGHEM, R. "The Diagnosis of Parasitic Mange of the Horse" (Note sur le diagnostic de la gale sarcoptique du cheval). *L'Echo Vét.*, Liège. Vol. XLVIII., No. 2. June 1919. Pp. 62-63.

— "The Etiology and Treatment of Granular Dermatitis" (Cause étiologique et traitement de la dermite granuleuse). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., Nos. 5-6. May-June 1919. Pp. 151-154.

Already abstracted from another source (see this *Review*, 1919, III. 46).

VELU, H. "Coccidiosis of the Goat in Morocco" (La coccidiose de la chèvre au Maroc et le parasitisme latent de *Eimeria arloingi*). *Bull. Soc. Path. Exot.*, Paris. Vol. XII., No. 6. June 1919. Pp. 298-301.

PATHOLOGY AND BACTERIOLOGY.

BOYER, E. E. H. "Studies on the Bacterial Flora of the Mouth and Nose of the Normal Horse." *Journ. Bacteriol.*, Baltimore. Vol. IV. 1919. Pp. 61-63.

Fifty-three different types of bacteria were isolated from the mouths and noses of normal horses. The most abundant forms were *B. gangraena*, *B. mesentericus*, *B. morbificans*, *B. prausnitzii*, *B. stellatus*, *B. subtilis*, *M. citreus*, *M. orbiculatus*, *S. lutea*, *Staph. epidermidis-albus*, *Streptothrix chromogena*, and certain moulds. *Strep. chromogena* was found in 32 per cent. of the mouths and 88 per cent. of the noses examined, moulds in 48 per cent. of the mouths and 64 per cent. of the noses, and *B. stellatus* (the most nearly universal of the true bacteria) in 32 per cent. of the mouths and 60 per cent. of the noses. (C.-E. A. W. in *Abstr. Bacteriol.*)

CROCKER, W. J. "Three Thousand Autopsies." *Cornell Veterinarian*. Vol. IX., No. 3. July 1919. Pp. 142-161.

A tabular statement of post-mortem examinations conducted at the Laboratory of Veterinary Pathology and Bacteriology, University of Pennsylvania, from 1st June 1909 to 1st June 1919.

JONES, F. S. "The Streptococci of Equines." *Journ. Exp. Med.*, Baltimore. Vol. XXX., No. 2. August 1919. Pp. 159-178. 1 Plate (4 Figures), 8 Tables.

KLIGLER, I. J. "Growth Accessory Substances for Pathogenic Bacteria in Animal Tissues." *Journ. Exp. Med.*, Baltimore. Vol. XXX., No. 1. July 1919. Pp. 31-44. 9 Tables.

"The growth of all the pathogenic bacteria studied was favourably influenced by the addition of small amounts of tissue extracts. Beef heart, rabbit and cat tissues, and human nasal secretions contain substances favourable to the growth of the organisms tested. The mucosa of different organs, spleen, liver, and kidney, are relatively rich in these substances, while muscle is relatively poor. The favourable effect of the extracts is manifested by growth and a reduction of lag. The water-soluble substances are apparently the ones essential for bacterial development; the ether extract has no effect on growth. Experiments are reported which indicate that the substances in question belong to the class of so-called vitamines."

M'FADYAN, J. "Botryomycosis." *Journ. Comp. Path. and Therap.* Vol. XXXII., No. 2. June 1919. Pp. 73-89. 11 Figures.

M'KINSTY, W. H., and CROPPER, J. W. "Memorandum on the Bacteria of the Proteus Group." *Journ. Roy. Army Med. Corps*, London. Vol. XXXIII., No. 2. August 1919. Pp. 168-174.

- SMITH, L. W. "Senile Changes of the Testis and Prostate in Dogs." *Journ. Med. Res.* Vol. XL., No. 1. May 1919. Pp. 31-51. 1 Plate.
- TRAUM, J. "Further Report on Lymphangitis in Cattle caused by Acid-Alcohol Fast Organism." *Journ. Amer. Vet. Med. Assoc.* Vol. LV, No. 6. September 1919. Pp. 639-652. 5 Figures.

PHARMACOLOGY AND THERAPEUTICS.

- HALL, M. C. "Studies on Anthelmintics. I. Experiments with Repeated Doses of Oil of Chenopodium." *Journ. Amer. Vet. Med. Assoc.* Vol. LV, No. 4. July 1919. Pp. 416-423.
- "Studies on Anthelmintics. III. Chloroform as an Anthelmintic." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 652-659.
- HALL, M. C., SMEAD, M. J., and WOLF, C. F. "Studies on Anthelmintics. II. The Anthelmintic and Insecticidal Value of Carbon Bisulphide against Gastro-Intestinal Parasites of the Horse." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 5. August 1919. Pp. 543-549.

- LE MOIGNIC and NORÉRO. "The Distribution in the Lung of Oils Injected into the Trachea" (Recherches sur la distribution dans le poumon des huiles injectées par la trachée). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 24. 26th July 1919. Pp. 1002-1004.

As the result of experiments on dogs, the authors found that oil, introduced into the trachea in small quantities, is not evenly distributed throughout the lungs. It mostly finds its way into the diaphragmatic lobe, and is only exceptionally abundant in the apical lobe. The lateral position is the most favourable to distribution in this lobe.

- MAIGRE, E. "The Action of Methylene Blue and Methylene Azure on the Cells of the Central Nervous System: their Antagonistic Action against Tetanus Toxin and Strychnin" (De l'action du bleu et de l'azur de méthylène sur les cellules nerveuses médullaires: action antagoniste vis-a-vis de la toxine tétanique et de la strychnine). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 23. 19th July 1919. Pp. 845-849.

Methylene blue and azure are capable of opposing, in a certain measure, the state of hyper-excitability of the neurons of the central nervous system that is produced by tetanus toxin and strychnin.

SCHAMBERG, J. F., KOLMER, J. A., RAIZISS, G. W., and TRIST, MARY E.
 "Sodium Oxy-Mercury-Ortho-Nitro Phenolate (Mercurophen), with
 Special Reference to its Practical Value as a Disinfectant." *Journ.
 Inf. Dis.* Vol. XXIV., No. 6. June 1919. Pp. 547-582. 4 Figures,
 36 Tables.

VELU, H. "Pyotherapy" (La pyotherapie). *Rev. Gén. Méd. Vét.* Vol.
 XXVIII., No. 330. June 1919. Pp. 297-311.

In this article Velu gathers up the main facts—historical, technical, and therapeutic—of the method of treatment by sterilised pus. A bibliography of twenty-six titles is appended.

— "The Convenience of Cachets in the Administration of Medicines to Small Animals" (Les cachets medicamentaux. Commodite de leur emploi chez les petits animaux). *Rec. Méd. Vét.* Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 3rd July 1919. Pp. 235-236.

The method of administration of medicine in cachets is very simple. The animal (sheep, goat, or pig) is seized by the ears and the head raised. The sheep or goat is held between the knees of the administrator. The cachet is moistened and thrown into the back of the mouth after this has been opened by force. In the pig, it is only necessary to wait for the opening of the mouth at the emission of a squeal. By this method of administration there is no danger of choking (as with fluids), and the exact dose is ensured.

PHYSIOLOGY.

AGNOLETTI, G. "The Action of Phenic Acid on the Smooth Musculature of Organs" (Ricerche sperimentali sull' azione dell' acido fenico sugli organi a muscolatura liscia). *La Clinica Vét.*, Milan. Vol. XLII., No. 11. 15th June 1919. Pp. 333-342. 1 Figure, 6 Tracings.

This is a preliminary note on the action of phenic acid on the muscular tone of the uterus, and an enquiry relative to its application to the cure of contagious abortion.

CERVERA, L. "The Ultra-Microscopic Study of Coagulation" (Estudio ultramicroscópico de la coagulación). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 6. June 1919. Pp. 312-349.

DECHAMBRE, P., and GINIEIS. "The Influence of Oestrus on the Fat Content of Milk" (Notes sur l'influence du rut sur la teneur du lait en matière grasse). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 13. 10th May 1919. Pp. 490-492.

In the majority of cows, oestrus causes a diminution in the amount of fat in the milk. The alteration rapidly appears, is more or less marked according to the individual, and is of short duration.

MADSEN, T., and WULFF, O. "The Influence of Temperature upon Phagocytosis" (Influence de la température sur la phagocytose). *Ann. Inst. Pasteur.* Vol. XXXIII., No. 7. July 1919. Pp. 437-447. 12 Tables.

The phagocytic power increases with the temperature to a maximum that corresponds exactly to the temperature of the individual from which the leucocytes have been obtained. An increase of temperature above this maximum causes a rapid diminution in phagocytosis. The increase of phagocytosis with temperature appears to follow the law of van't Hoff-Arrhenius.

MOUQUET, A. "Gestation in the Hippopotamus" (Gestations d'une femelle d'hippopotame. Alimentation et reproduction chez les animaux captifs). *Rec. Méd. Vét.* Vol. XCV., No. 13. 15th July 1919. Pp. 406-417.

SCHILLING, S. "The Blood-Pressure of the Horse." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 401-416. 2 Figures, 3 Graphs, 5 Tables.

POULTRY DISEASES.

DONNAT. "Avian Diphtheria" (Diphthérie aviare). *Rec. Méd. Vét.* Vol. XCV., No. 14. 30th July 1919. *Bull. Soc. Centr. Méd. Vét.* 17th July 1919. Pp. 248-259.

KAUPP, B. F. "Sarco-Chondro-Osteomata of a Hen." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 424-427. 3 Figures.

There was an irregular tumour on each side of the chest attached to ribs. A third hard tumour was observed on the leg just above the hock.

— "Tendonitis and Periostitis Resulting from Injury by a Celluloid Spirolet Leg Band." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 428-435. 2 Figures.

A celluloid identification leg band worked its way to near the hock of a fowl and became, by pressure, partly imbedded in the skin of the region.

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Tendonitis and, later, productive inflammation with periostitis developed. *Staphylococcus pyogenes aureus* was isolated in pure culture from an abscess of the hock.

MERCIER, L., and LEBAILLY. "Myxosarcoma in a Fowl" (*Myxosarcome et acariens chez une poule*). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 21. 5th July 1919. Pp. 802-803.

The authors found a myxosarcoma, of the size of a walnut, connected with the wall of an abdominal air-sac. The respiratory apparatus, including the air-sacs, was invaded with *Cytolichus nudus* Viz., and the writers apparently think there may be some causal connection between the tumour and the presence of the parasites. They recall that observers have been able to cause the appearance of tumours in the fowl by the injection of the filtrate of tumours. They ask if the *Cytolichus nudus* may not have played the same part as the needle of the syringe in these injection experiments.

MULSOW, F. W. "The Differentiation and Distribution of the Para-Typhoid-Enteritidis Group. VI. Avian Paratyphoid Bacilli: a Comparative Study of *B. pullorum* and *B. sanguinarium*." *Journ. Inf. Dis.* Vol. XXV., No. 2. August 1919. Pp. 135-162. 22 Tables.

TYZZER, E. E. "Developmental Phases of the Protozoon of 'Blackhead' in Turkeys." *Journ. Med. Res.* Vol. XI., No. 1. May 1919. Pp. 1-30. 2 Plates (32 Figures), 2 Text-Figures.

SEROLOGY AND IMMUNOLOGY.

CARTER, E. B. "Mixed or Simple Bacterins, Which shall we Use?" *Amer. Journ. Vet. Med.* Vol. XIV., No. 7. July 1919. Pp. 338-339.

"In the light of our present knowledge it would seem that a wholesale condemnation of mixed bacterins is not only uncalled for, but that it is decidedly unscientific."

CURASSON. "The Rapid Production of Anti-Rinderpest Serum and its Use in an Infected Area" (*Note sur la production rapide de sérum contre la peste bovine et son utilisation en région infectée*). *Rec. Méd. Vét.* Vol. XCV., No. 11. 15th June 1919. Pp. 323-327.

GOVAERTS, P. "The Rôle of the Blood Plates in Natural Immunity" (*Le rôle des plaquettes sanguines dans l'immunité naturelle*). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 23. 19th July 1919. Pp. 927-929.

The rôle of the blood plates is similar to that of the phagocytes, but their action is more rapid, for they exercise the function in the circulating blood,

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while phagocytosis takes place in the capillaries. The blood plates form the first barrier opposed to foreign bodies introduced into the circulation.

HART, G. H. "Failure of Blackleg Culture Filtrate to Confer Lasting Immunity in Animals Vaccinated under Six Months of Age." *Journ. Amer. Vet. Med. Assoc.* Vol. I.V., No. 4. July 1919. Pp. 427-428.

One calf, vaccinated at the age of one month, had lost its immunity, and became naturally infected with the disease four months and five days after being vaccinated. Another calf, vaccinated when over three months old, had lost its immunity, and succumbed to a natural infection with blackleg four months after being vaccinated. "In many parts of California it is necessary to vaccinate calves well under six months of age to prevent losses. When such vaccination is applied to young animals it should be repeated twice yearly, the same as though the old muscle vaccine were being used."

JENSEN, H. "What we have Learned about Biologic Products." *Amer. Journ. Vet. Med.* Vol. XIV., No. 6. June 1919. Pp. 275-278.

KRAUS, R., and BELTRAMI, P. "Immunity in Anthrax" (Estudios sobre la inmunidad en el carbunclo bacteriano). *Ann. Soc. Rural Argentina*, Buenos Aires. Vol. LIII. 1918. Pp. 343-345.

The writers report a few experiments indicating that when an animal is completely immunised against anthrax with the Pasteur vaccine the body destroys the virulent germs, which either disappear or remain within the body in an attenuated or avirulent condition. It is probable that the attenuation of the bacilli precedes their destruction. None of the modern theories of immunity explain this phenomenon of attenuation observed by the writers. (H. J. C. in *Abstr. Bacteriol.*)

RICHET, C., BRODIN, P., and SAINT-GIRONS, F. "The Immunising Action of Chloride of Sodium against Anaphylaxis" (De l'action immunisante du chlorure de sodium contre l'injection anaphylactique déchainante (Thérapeutique métatropique)). *C. R. Acad. Sci.*, Paris. Vol. CLXIX., No. 1. 7th July 1919. Pp. 9-11.

VINAVER, S., and FRASEY, V. "The Production of Antistreptococcic Immunity" (Recherches expérimentales sur l'immunité antistreptococcique). *C. R. Soc. Biol.*, Paris. Vol. LXXXII, No. 17. 7th June 1919. Pp. 606-608.

A horse vaccinated with a single dose of living virulent human streptococci gives a serum superior to that obtained by a fractional immunisation spread over several months. After fifteen days the serum already shows very

active preventive properties, not only against the streptococcus employed in immunisation, but also against other streptococci. The injection of a very strong dose, such as 1 litre of a living culture of streptococci, into the vein of the horse does not produce a stronger thermic reaction than a smaller dose. All the same, a very large quantity of virus does not appear to produce a better result than a smaller dose.

WARD, H. C. "Blackleg Aggressin." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 394-401. 6 Tables.

"The results thus obtained from the most recent experiments show clearly the protective value of aggressin against highly active blackleg virus. . . . There was no question but that the low aggressin animals possessed a positive degree of immunity. Careful post-mortem studies demonstrated that the infection was much less extensive as compared with the control infection, amounting to about one-fourth that of the unprotected animal. In addition, cultures were obtained from every portion of the body of normal heifers, but only from the original site of injection in the aggressin heifers. Likewise, the controls all died early, and symptoms were more typical."

SURGERY.

BERTON, P. "Two Observations on Cutaneous Lesions Produced by Mustard Gas" (Deux observations sur les lésions cutanées déterminées par l'ypérite). *Rec. Méd. Vét.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vét.* 15th May 1919. Pp. 186-189.

Two observations of the effect of dichlorethylsulphide on the skin of the horse. After a few hours the hair lost its shine and the skin became thickened. Twenty-four to thirty-six hours after the explosion of the gas shell, vesicles, more or less numerous, appeared, and became confluent. The epidermis gradually peeled off, leaving islands of raw surface. These coalesced, and soon became large irregular wounds. At some points there was actual sloughing of the skin. The lesions might be described as burns of the second degree. After three weeks or a month of appropriate treatment the wounds healed with a regular cicatrisation, leaving no appreciable retraction or thickening. Lesions of the cornea were serious. In one horse the eye for three weeks was a veritable fountain of pus.

[For reports on the experimental action of "mustard gas," see Warthin, Weller and Herrmann, *Journ. Lab. and Clin. Med.* 1918, IV., 785-832; 1919, V., 229-306 (this *Review*, 1919, III. 133 and 260).]

CINOTTI, F. "Rhinostomy: a New Operation in Cases of Paralysis of the Nasal Diverticulum" (*Rhinostomia: Nueva intervención quirúrgica en los casos de parálisis de las falsas narices*). *Revista Soc. Med. Vet.*, Buenos Aires. Vol. IV., No. 4. April 1919. Pp. 107-111. 2 Figures.

Already abstracted from another source (*Review*, 1919, III. 209).

CONRADT, E. "The Prevention of 'Capped Elbow' by Means of a Sub-sternal Pad" (*Prophylaxie des lésions du coude chez le cheval (éponge) au moyen d'un coussin sous-sternal*). *L'Écho Vet.*, Liège. Vol. XLVIII., No. 2. June 1919. Pp. 63-65. 1 Figure.

The pad is made by wrapping several layers of sacking round a surcingle.

CURASSON. "Nasal 'Horns' of Traumatic Origin in the Ox, Sheep, and Goat" (*Les cornes nasales d'origine traumatique chez le bœuf, le mouton et la chèvre*). *Rec. Méd. Vet.* Vol. XCV., Nos. 10 and 12. 30th May-30th June 1919. *Bull. Soc. Centr. Méd. Vet.* 15th May 1919. Pp. 182-186. 2 Figures.

GUILLAUME, A. "A Simplified Operation for Paralysis of the Penis in the Horse" (*Traitemenit chirurgical simplifié de la paralysie du pénis chez le cheval*). *Rev. Gén. Méd. Vet.* Vol. XXVIII., No. 329. May 1919. Pp. 243-247. 4 Figures.

HAMOIR, J. "The Treatment of 'Quittor'" (Le traitement du javart cartilagineux). *L'Écho Vet.*, Liège. Vol. XLVIII., No. 1. May 1919. Pp. 22-32.

We rejoice at the re-appearance of *L'Écho Vétérinaire*, of which M. Joseph Hamoir is the new editor, and in the first number of which he gives a summary account of the modern modes of treatment of "quittor."

HUBSCHER, A. "Chronic Arthritis of the Femoro-Tibial Articulation in Cattle" (*Die chronische Hinterkniegelenksentzündung beim Rind*). *Schweizer Arch. f. Tierheilk.*, Zürich. Vol. LXI. Nos. 7-8. July-August 1919. Pp. 275-285.

M'KILLIP, M. H. "Lameness, Consideration of Predisposing Causes as an Aid to Diagnosis." *Amer. Journ. Vet. Med.* Vol. XIV., No. 6. June 1919. Pp. 270-272.

This instalment of a series of communications by the same author deals with conformation as a predisposing cause of lameness.

NAVEZ, O. "On the Nature of Laryngeal Hemi-Atrophies in the Horse" (*Sur la nature des hémiatrophies laryngiennes chez le cheval*). *Ann. Méd. Vet.*, Brussels. Vol. LXIV., Nos. 3-4. March-April 1919. Pp. 94-108.

NAVEZ, O. "Laryngeal Hemiplegia ('Roaring')" (Nouvelle série de recherches sur le cornage chronique par hémiplégie laryngienne). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., No. 1. January 1919. Pp. 6-24. *Ibid.* No. 2. February 1919. Pp. 52-60. *Ibid.* Nos. 3-4. March-April 1919. Pp. 73-80.

SCHWENDIMANN, F. "A New Firing Apparatus" (Ein neuer Brennapparat). *Schweizer Arch. f. Tierheilk.*, Zürich Vol. LXI., Nos. 7-8. July-August 1919. Pp. 285-288.

A new electric thermo-cautery made by Schärer of Bern.

VAN WALLENDAEL. "The Treatment of Wounds by the Methods of Wright and Carrel" (Traitement des plaies, méthode de Wright, méthode de Carrel). *Ann. Méd. Vét.*, Brussels. Vol. LXIV., Nos. 3-4. March-April 1919. Pp. 86-93.

A general description of the two methods of wound treatment.

TERATOLOGY.

DANFORTH, C. H. "The Developmental Relations of Brachydactyly in the Domestic Fowl." *Amer. Journ. Anat.* Vol. XXV., No. 2. March 1919. Pp. 97-115. 5 Figures.

FAURE, C. "Rudimentary Hermaphroditism in a Cock" (Note sur un cas d'hermaphroditisme rudimentaire chez le coq). *C. R. Soc. Biol.*, Paris. Vol. LXXXII., No. 14. 17th May 1919. Pp. 519-520.

The case described is that of a three-year old cock, in which there were two malformed testes with the complete absence of any phases of spermatogenesis. The seminiferous tubules were lined by a single layer of epithelial cells. Certain of the external secondary sexual characters of the female were present. The author thinks that the case should be classed as rudimentary or false hermaphroditism.

HUNT, R. H. "Vascular Abnormalities in a Domestic Cat" (*Felis domestica*). *Anat. Record.* Vol. XVI., No. 2. April 1919. Pp. 87-91. 1 Figure.

WILDER, I. W. "An Anomaly in the Portal Circulation of the Cat." *Anat. Record.* Vol. XVI., No. 2. April 1919. Pp. 79-85. 4 Figures.

TOXICOLOGY.

BEATH, O. A. "The Chemical Examination of Three Species of Larkspurs, *Delphinium barbeyi*, *D. glaucescens*, *D. geyeri*." *Bull. No. 120. Univ. Wyoming Agric. Exp. Station.* June 1919. Pp. 55-88. 11 Figures, 4 Charts.

GRAHAM, R., and BRUECKNER, A. L. "Studies in Forage Poisoning or Cerebro-Spinal Meningitis in Horses." *Journ. Bacteriol.*, Baltimore. Vol. IV. 1919. Pp. 1-21.

An anaerobic Gram-positive spore-bearing bacillus closely resembling *B. botulinus* was isolated from corn silage which had apparently caused an outbreak of forage poisoning in horses in Ottawa, Ill., in 1916. It develops under aerobic conditions in association with Fusorium. It elaborates a powerful soluble toxin, and produces in mules a symptom complex closely resembling that of natural forage poisoning. Antitoxic serum prepared by injecting a goat with sublethal doses of toxin exhibited high protective power in guinea-pigs and horses, and immune serum prepared by injection of *B. botulinus* toxin gave an equal protection against the ensilage organism. Cross agglutination tests also indicated a close relationship between the two organisms. The etiological significance of *B. botulinus* or closely allied anaerobes in forage poisoning or cerebro-spinal meningitis of horses and mules is strongly indicated. (C.-E. A. W. in *Abstr. Bacteriol.*)

HEWETSON, W. T. "Poisoning by Eating Potato Tops." *Vet. Record.* Vol. XXXII, No. 1626. 6th September 1919. Pp. 104-105.

Cattle gained access to a potato field where the tops were very green. Some of the animals died. "The symptoms manifested by those cattle that were least affected were as follows:—They appeared dull and listless, the nose dry, and saliva dropping from the mouth. The bowels were not distended with gas, nor did they appear even to be full. The tips of the ears were cold, and the internal temperature registered 102° F. They were inclined to scour, and small "blebs" or balls of white mucus were noticed passing with the dung. The breathing of the animals was normal."

MARSH, C. D., CLAWSON, A. B., and MARSH, H. "Oak-Leaf Poisoning of Domestic Animals." *Bull. No. 767. Professional Paper U.S. Dept. Agric.* 28th April 1919. Pp. 36. 19 Figures.

MULVEY, W. S. "Some Cases of Buttercup Poisoning in Cattle." *Vet. Journ.* Vol. LXXV., No. 8. August 1919. Pp. 55-57.

The symptoms were those of abdominal pain and complete amaurosis. Post-mortem examination revealed intense inflammation of the stomach and intestine.

ORDONEZ, G. "Curious Poisoning in Young Pigs" (Una curiosa intoxication en cerdos jovenes). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 9. September 1919. Pp. 576-577.

In two successive years, the author of this note reports, there has been an epidemic among the young pigs belonging to a particular owner. On post-mortem examination, nothing was discovered except congestion of all the viscera. The author concludes from his observations that the cause of death was the continued ingestion of ants (*Formica pratensis obrera*).

ROÉLAND, C. "Poisoning with Barium Chloride" (Intoxications par le chlorure de baryum chez le cheval). *Rev. Path. Comp.*, Paris. Vol. XIX., No. 158. July 1919. Pp. 21 (201)-22 (202).

The author recalls cases of sudden death that have been recorded as having occurred in the horse after the intravenous injection of barium chloride. He relates his own experience in two cases in which he tried to induce death in this way, and failed. He thinks that the fatal cases have been due to some impurity in the barium chloride, and that the pure salt is much less toxic than is supposed.

TUBERCULOSIS.

BARNES, M. F. "Generalized Tuberculosis of the Horse." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 6. September 1919. Pp. 672-675. 2 Figures.

The animal was a gelding, eight years old. "The report of autopsy upon this animal shows that there was a fibrinous pleurisy; lymph glands were haemorrhagically swollen; otherwise the spleen and the lungs were the only organs affected, the latter showing evenly distributed lesions throughout their substance." From inoculation experiments on guinea-pigs and rabbits, it appears that the tubercle bacillus in this case was of the bovine type. "The source of the infection of this horse is not known, but inasmuch as this animal was stabled in a basement barn with cattle, it is quite probable that there has been a bovine spreader of the disease in the stable at some time leaving the stable or feed contaminated with tubercle bacilli of the bovine type."

BERTOLINI, G. "On the Nature of the Cuneiform Renal Lesions in Adult Tuberculous Bovines, and their Significance in the Inspection of Meat" (Sulla natura dei cosiddetti focolai cuneiformi renali in bovini adulti tubercolotici e sul loro significato nell'ispezione delle carni). *La Clinica Vet.*, Milan. Vol. XLII., Nos. 13-14. 15th-31st July 1919. Pp. 414-424.

JONES, D. H. "Subcutaneous Tuberculin Re-test of Cattle." *Journ. Amer. Vet. Med. Assoc.* Vol. LV., No. 4. July 1919. Pp. 444-446.

The observations here recorded appear to support Gilliland's theory that "if animals that had given a suspicious reaction were to receive five to ten days later a much larger dose they would give a strong reaction if tuberculous, and a negative result if non-tuberculous."

LEONARD, L. B. "Tuberculosis and Accredited Herd Plan." *Cornell Veterinarian.* Vol. IX., No. 3. July 1919. Pp. 162-166.

"That tuberculosis can be eradicated is not a theory, but a fact. Demonstrations have been carried on in the Districts of Columbia, Virginia, and other States. There is a compulsory law in the District passed by Congress. In ten years the percentage of reactors has been reduced in all the herds from eighteen to a fraction of 1 per cent. Statistics show in this State that in regularly tested herds the number of reactors has been reduced. It is seldom that a reactor is found in localities where milk ordinances are enforced. Compulsory physical examination of herds has also reduced the clinical cases."

PLA Y ARMENGOL, R. "Treatment of Tuberculous Septicæmia" (Tratamiento de la septicemia tuberculosa). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 9. September 1919. Pp. 549-560.

The author believes that bacteræmia in tuberculosis is not due to the bacillus of Koch but to the tuberculogenous bacterium A of Ravetllat.

PRESTA, A. "Treatment of Tuberculous Septicæmia" (Septicemia tuberculosa. Tratamiento). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 9. September 1919. Pp. 560-566.

RAVETLLAT, J., and PLA Y ARMENGOL, R. "Transformation of the Bacillus of Koch into the Tuberculogenous Bacterium A" (Transformacion in vitro del bacilo de Koch en bacteria tuberculogena A). *Revista Hig. y Sanidad Pecuarias*, Madrid. Vol. IX., No. 9. September 1919. Pp. 547-549.

According to what has been called the "new bacteriology of tuberculosis" of Ravetllat, three different forms of organisms are capable of producing tuberculosis. These have been designated A, B, and C. C is the *B. tuberculosis* discovered by Koch.

VON WEDEL, H. "A Contribution to the Study of the Complement Fixation Reaction for Tuberculosis." *Journ. Immunol.*, Baltimore. Vol. III. 1918. Pp. 351-369.

In a large series of complement fixation tests upon tuberculosis sera specific results were obtained in a very large percentage of positive cases,

while negative results were obtained in all cases where tuberculosis was not present. The technique of the test is given. The antigen was that recommended by Miss Wilson. It was found that as sera at first negative sometimes gave positive results upon standing in the ice-box a week, tests should be made after an interval at ice-box temperature. Double the original Wasserman amount of patients' serum should be used. Complement should be obtained from pooled sera or from serum of an individual guinea-pig which has been tested for fixability. (M. W. C. in *Abstr. Bacteriol.*)

WANG, CHUNG YIK, and CROCKET, J. "Diagnosis of Tuberculosis by the Complement Deviation Method." *Brit. Med. Journ.* No. 3053. 5th July 1919. Pp. 7-9. 5 Tables.

"The findings of the cases investigated therefore furnish 85 per cent. positives out of 104 tuberculosis subjects. As none of the controls that have been examined reacted positively to the test, it may be justifiable to regard the test as specific, and where a reaction is provoked a diagnosis may be safely pronounced, not only that the disease is present, but also that the lesion is in an active condition."

WILSON, M. A. "A Contribution to the Study of the Complement Fixation Reaction in Tuberculosis." *Journ. Immunol.*, Baltimore. Vol. III. 1918. Pp. 345-350.

I. *On the Standardisation of Complement.*—In the complement fixation action with tuberculous sera, variations were found in the suitability of guinea pigs for use as complement. All complements were therefore tested for fixability with tuberculosis antigen and tuberculosis serum before use in a complement fixation test upon an unknown serum. The technique of the test, including the preparation of the antigen, is given.

II. *Observation of the von Wedel Reaction.*—Sera from active cases of tuberculosis which gave negative reactions the first day were found, in a significant percentage of cases, to become positive after remaining a week at ice-box temperature. The positive reaction at the later period was not due to an acquisition of anti-complementary properties, nor was the reaction non-specific. (M. W. C. in *Abstr. Bacteriol.*)

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